53. The plant cell of claim 52, wherein said fourth coding sequence comprises at least a portion of the nucleotide sequence set forth in SEQ ID NO: 24.

54. The plant cell of claim 52 further comprising in its genome a fifth DNA construct comprising a promoter that drives expression in a plant cell operably linked to a fifth coding sequence, wherein said fifth coding sequence encodes an NADH kinase or an NAD^+ kinase and said fifth coding sequence is operably linked to a nucleotide sequence encoding a peroxisome-targeting signal.

55. The plant cell of claim 54, wherein said fifth coding sequence comprises at least a portion of a nucleotide sequence selected from the group consisting of SEQ ID NOs: 25-27.

56. A plant cell genetically manipulated to produce polyhydroxyalkanoate in its peroxisomes, said plant cell comprising in its genome:

a stably integrated first DNA construct comprising a promoter that drives expression in a plant cell operably linked to a first coding sequence, wherein said first coding sequence encodes a polyhydroxyalkanoate synthase and is operably linked to a nucleotide sequence encoding a peroxisome-targeting signal;

a stably integrated second DNA construct comprising a promoter that drives expression in a plant cell operably linked to a second coding sequence, wherein said second coding sequence encodes an acetyl-CoA:acetyl transferase and is operably linked to a nucleotide sequence encoding a peroxisome-targeting signal; and

a stably integrated third DNA construct comprising a promoter that drives expression in a plant cell operably linked to a third coding sequence, wherein said third coding sequence is operably linked to a nucleotide sequence encoding a peroxisome-targeting signal and said third coding sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding a 3-ketoacyl-CoA reductase that is capable of utilizing NADH;

(b) a nucleotide sequence set forth in SEQ ID NO: 3;

(c) a nucleotide sequence set forth in SEQ ID NO: 22;

(d) the nucleotide sequence set forth in SEQ ID NO: 1;

(e) a nucleotide sequence encoding a multifunctional protein-2, wherein the hydratase activity of said multifunctional protein has been eliminated; and

(f) the nucleotide sequence set forth in SEQ ID NO: 6.

57. The plant cell of claim 56, wherein said second coding sequence comprises at least a portion of the nucleotide sequence set forth in SEQ ID NO: 24.

58. A plant cell genetically manipulated for the synthesis in its peroxisomes of at least one intermediate molecule in polyhydroxyalkanoate synthesis, said plant cell comprising in its genome at least one stably incorporated DNA construct comprising a coding sequence for an enzyme involved in the synthesis of said intermediate molecule, said coding sequence operably linked to a promoter that drives expression in a plant cell and to a nucleotide sequence encoding a peroxisome-targeting signal, wherein said coding sequence is selected from the group consisting of:

(a) a nucleotide sequence encoding a 2-enoyl-CoA hydratase that is capable of catalyzing the synthesis of R-(-)-3-hydroxyacyl-CoA ;

(b) a nucleotide sequence set forth in SEQ ID NO: 21;

(c) a nucleotide sequence comprising the 2-enoyl-CoA hydratase domain of a multifunctional protein-2.

(d) a nucleotide sequence set forth in SEQ ID NO: 4;

(e) a nucleotide sequence set forth in SEQ ID NO: 1;

(f) a nucleotide sequence encoding a multifunctional protein-2, wherein the dehydrogenase activity of said multifunctional protein has been eliminated; and

(g) a nucleotide sequence encoding a 3-ketoacyl-CoA reductase that is capable of utilizing NADH;

(h) a nucleotide sequence set forth in SEQ ID NO: 3;

(i) a nucleotide sequence set forth in SEQ ID NO: 22;

(j) the nucleotide sequence set forth in SEQ ID NO: 1;

(k) a nucleotide sequence encoding a multifunctional protein-2, wherein the hydratase activity of said multifunctional protein has been eliminated; and

(l) the nucleotide sequence set forth in SEQ ID NO: 6.

59. The plant cell of claim 58, wherein said intermediate molecule is an R-(-)-3-hydroxyacyl-CoA or a 3-ketoacyl-CoA.

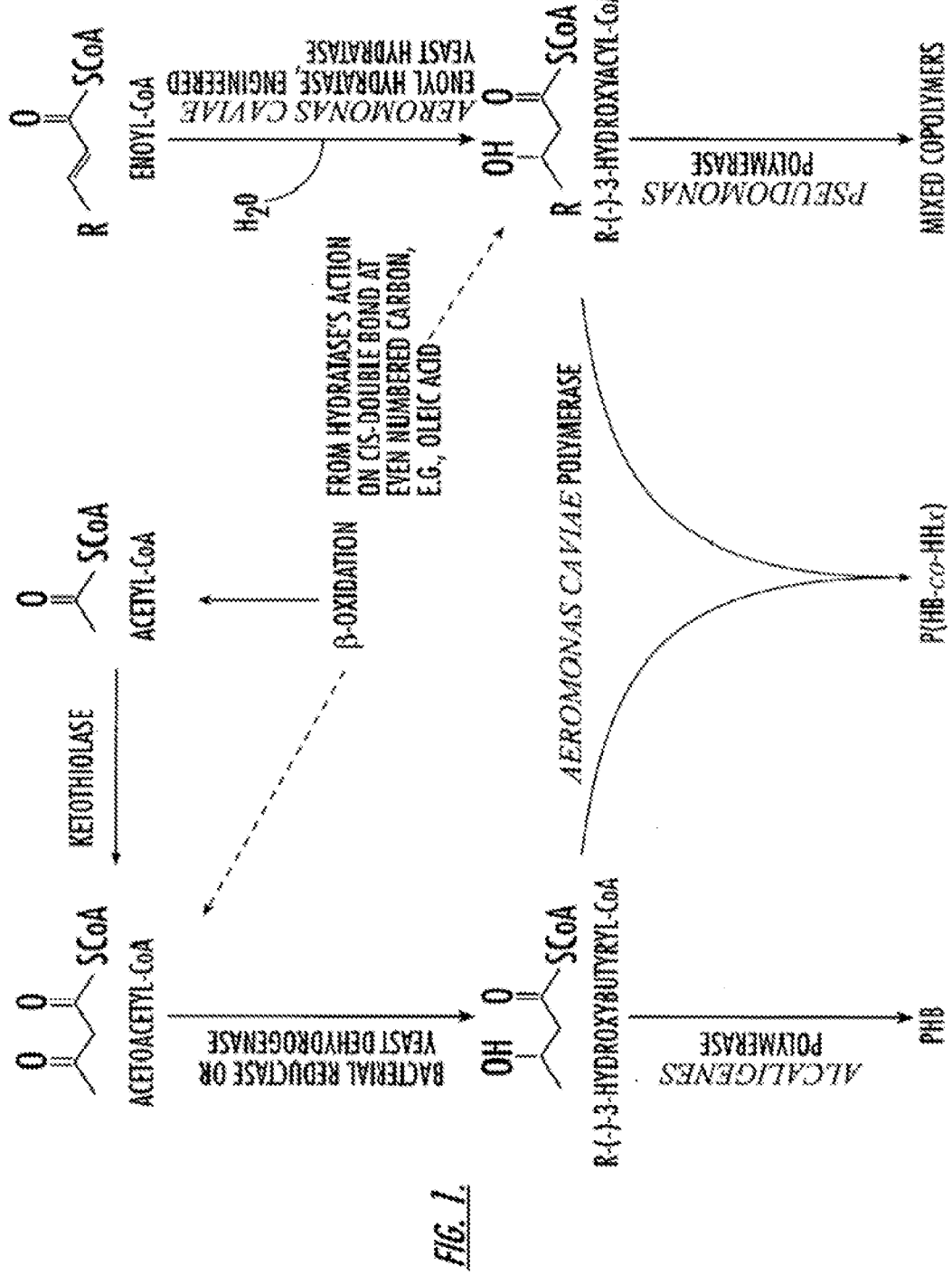
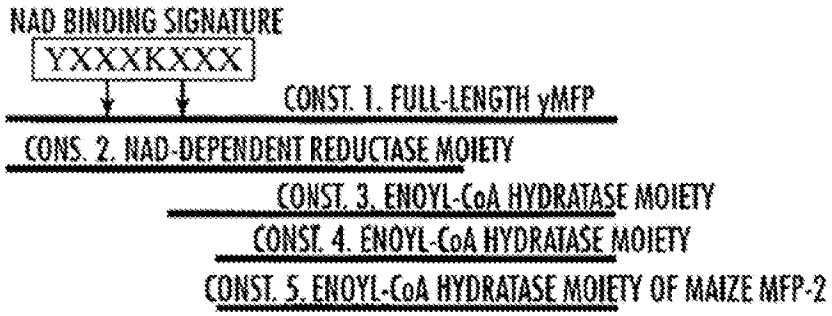

ACETOACETYL-CoA
BACTERIAL REDUCTASE OR YEAST DEHYDROGENASE
R-(-)-3-HYDROXYBUTYRYL-CoA
ALCALIGENES POLYMERASE
PHB
KETOTHIOLASE
ACETYL-CoA
β-OXIDATION
FROM HYDRATASE'S ACTION ON CIS-DOUBLE BOND AT EVEN NUMBERED CARBON, E.G., OLEIC ACID
AEROMONAS CAVIAE POLYMERASE
P(HB-co-HHx)
ENOYL-CoA
AEROMONAS CAVIAE ENOYL HYDRATASE, ENGINEERED YEAST HYDRATASE
H2O
R-(-)-3-HYDROXYACYL-CoA
PSEUDOMONAS POLYMERASE
MIXED COPOLYMERS

FIG. 1.



CONSTRUCT 1 (WILD TYPE yMFP):
FULL-LENGTH OF YEAST MULTIFUNCTIONAL PROTEIN

CONSTRUCT 2 (REDUCTASE):
C-TRUNCATED VERSION OF yMFP LACKING 271 AMINO ACIDS

COSTRUCT 3 (HYDRATASE):
N-TRUNCATED VERSION OF yMFP LACKING 318 AMINO ACIDS

COSTRUCT 4 (HYDRATASE):
N-TERMINALLY TRUNCATED VERSION OF yMFP LACKING 477 AMINO ACIDS

CONSTRUCT 5 (HYDRATASE):
MAIZE MFP-2

FIG. 2.

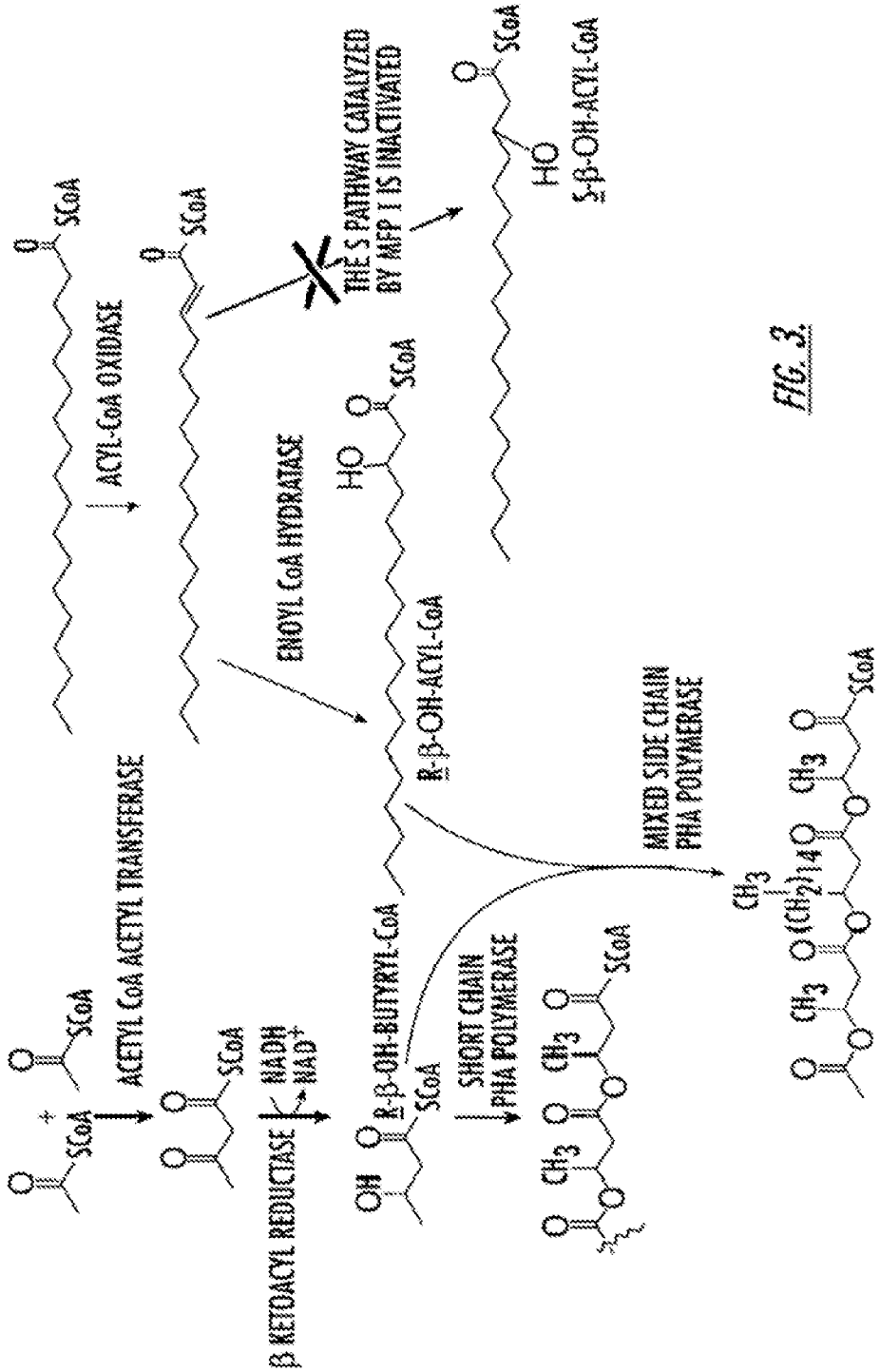


FIG. 3.

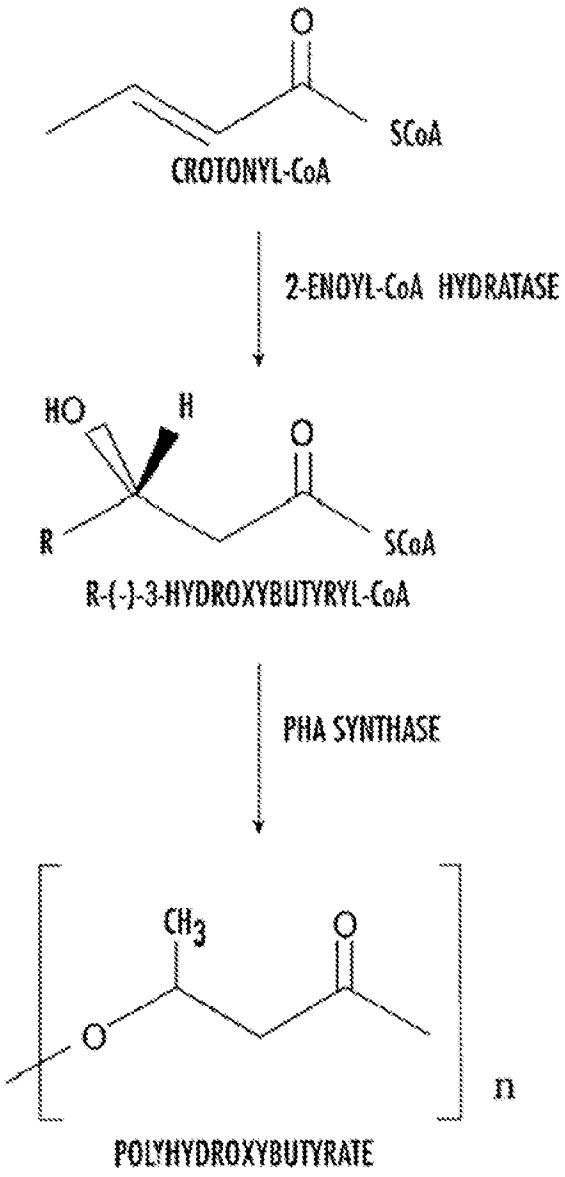


FIG. 4.

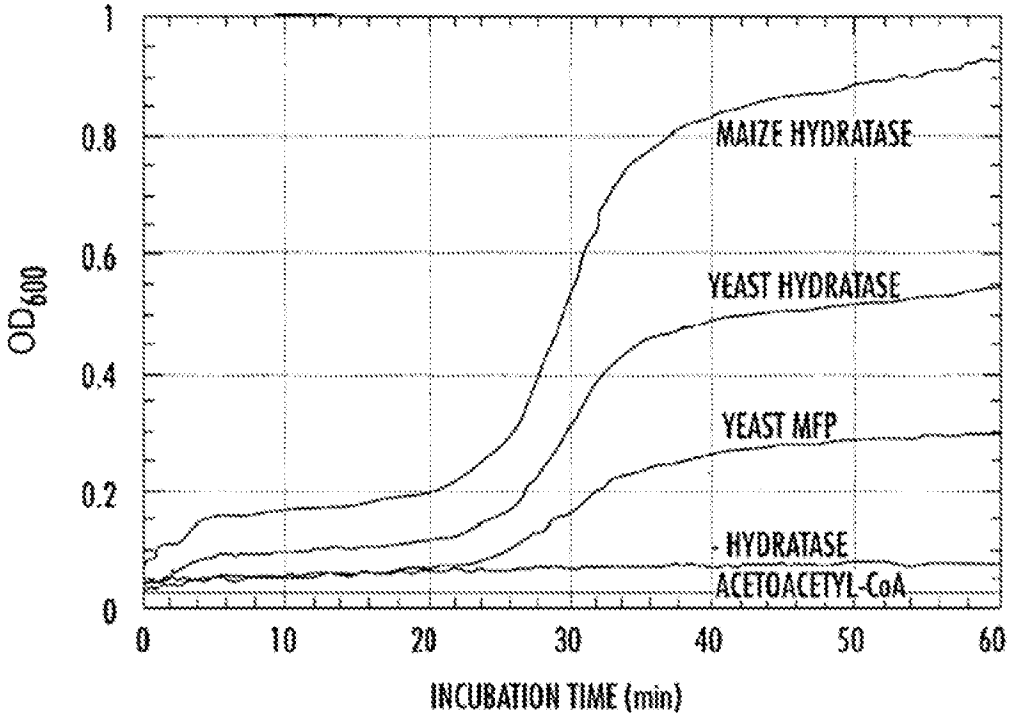


FIG. 5

SEQUENCE LISTING

<110> Nichols, Scott E
Li, Chun Ping
Dong, Jian G
Hitz, William D
Liebergesell, Matthias
Dhugga, Kanwarpal S
Briggs, Kristen K

<120> PRODUCTION OF POLYHYDROXYALKANOATE IN PLANTS

<130> 5710-02-1-PC

<140>
<141>

<150> 60/156807
<151> 1999-09-29

<160> 27

<170> PatentIn Ver. 2.1

<210> 1
<211> 1362
<212> DNA
<213> Zea mays

<220>
<221> CDS
<222> (233)..(1174)

<400> 1
gaattcccgg gtcgacccac gcgtccggtc ggcggggctg ccgcctgccg catcctcccc 60

tcgcccaccg tcgacgactt gatcccctcc caccgttgag gccgcctcct cacggcagcg 120

agccagcgac tcctctcttc gtctcctaca agtagccaga caccactccg actttgccgg 180

caacccgtcg acagcgacga ggcgcagcat aaggcatacg ggcacgggcgg cc atg gcg 238
Met Ala
1

acc agc tcc aaa ccc gcc gcg ccc gtg gac ccc atg gtc gtg ctc gcc 286
Thr Ser Ser Lys Pro Ala Ala Pro Val Asp Pro Met Val Val Leu Ala
5 10 15

cac gag ttc ccc gag gtg tcs ttc gac tac gac gag agg gat gta gcg 334
His Glu Phe Pro Glu Val Ser Phe Asp Tyr Asp Glu Arg Asp Val Ala
20 25 30

ttg tac gcg ctc ggg gtt ggt gcc tgc ggc gat gac gcc gtc gac gag 382
Leu Tyr Ala Leu Gly Val Gly Ala Cys Gly Asp Asp Ala Val Asp Glu
35 40 45 50

aag gag ctt cac ttc gtg tac cac agg gat ggg cag cca cac att aag 430
Lys Glu Leu His Phe Val Tyr His Arg Asp Gly Gln Pro His Ile Lys
55 60 65

```
acc ctt cct act ttt gtt tct tta ttt ccc aac aag aac agc aat ggg   478
Thr Leu Pro Thr Phe Val Ser Leu Phe Pro Asn Lys Asn Ser Asn Gly
                70                  75                  80

ctt gga ttt gtt gat gtg cct ggc ctt aac ttt gat gca agc ctt cta   526
Leu Gly Phe Val Asp Val Pro Gly Leu Asn Phe Asp Ala Ser Leu Leu
            85                  90                  95

ctg cat ggt caa caa tac ata gag atc tat agg cca atc cct tcg tat   574
Leu His Gly Gln Gln Tyr Ile Glu Ile Tyr Arg Pro Ile Pro Ser Tyr
        100                 105                 110

gtc agt gtt gta aac agg gtt aaa gta gtt ggt ttg cac gac aag ggg   622
Val Ser Val Val Asn Arg Val Lys Val Val Gly Leu His Asp Lys Gly
    115                 120                 125                 130

aaa gca act att ctt gag ctc gaa act acc aca agc ctc aaa gag tca   670
Lys Ala Thr Ile Leu Glu Leu Glu Thr Thr Thr Ser Leu Lys Glu Ser
                135                 140                 145

ggg gaa att tta tgc atg aac agg agt act atc tac ttg cgt ggt gct   718
Gly Glu Ile Leu Cys Met Asn Arg Ser Thr Ile Tyr Leu Arg Gly Ala
            150                 155                 160

gga ggg ttt tca gac tct tca cgg cca tac tca tat gct acc tat cct   766
Gly Gly Phe Ser Asp Ser Ser Arg Pro Tyr Ser Tyr Ala Thr Tyr Pro
        165                 170                 175

gct aat caa gtt tct cgc att tcr att cca aat tcg gca cct tct gca   814
Ala Asn Gln Val Ser Arg Ile Ser Ile Pro Asn Ser Ala Pro Ser Ala
    180                 185                 190

gta tgc gac gac cag aca aag caa tcc cag gca ttg tta tac agg cta   862
Val Cys Asp Asp Gln Thr Lys Gln Ser Gln Ala Leu Leu Tyr Arg Leu
195                 200                 205                 210

tcr ggg gat tac aat cct ttg cat tca gac cca gat att gca cag ctt   910
Ser Gly Asp Tyr Asn Pro Leu His Ser Asp Pro Asp Ile Ala Gln Leu
                215                 220                 225

gct ggg ttc acc cgt cca atc ctg cac ggc ctc tgc acc cta gga ttc   958
Ala Gly Phe Thr Arg Pro Ile Leu His Gly Leu Cys Thr Leu Gly Phe
            230                 235                 240

gct gct cgc gcc gtc ata aaa tct ttc tgc aac ggc gaa ccg act gcg   1006
Ala Ala Arg Ala Val Ile Lys Ser Phe Cys Asn Gly Glu Pro Thr Ala
        245                 250                 255

gtg aag agc atc ttc ggc cgt ttc ctt ctg cac gtc tac ccc ggg gaa   1054
Val Lys Ser Ile Phe Gly Arg Phe Leu Leu His Val Tyr Pro Gly Glu
    260                 265                 270

acg ttg tcc act gag atg tgg ctt gac ggc cag aag gtg cac tac caa   1102
Thr Leu Ser Thr Glu Met Trp Leu Asp Gly Gln Lys Val His Tyr Gln
275                 280                 285                 290

acg aag gcc aag gag cgg aac cga gct gtc ctc tct gga tat gtg ttg   1150
Thr Lys Ala Lys Glu Arg Asn Arg Ala Val Leu Ser Gly Tyr Val Leu
                295                 300                 305
```

```
ctc cag cac atc ccc tcg tca ttg taagtaaaag tttgtttct taaaattggt  1204
Leu Gln His Ile Pro Ser Ser Leu
            310

gcccgctgaa agcatttggc ttggctgtga taaattgagc acgaggtggg ctgccactgt 1264

aatgatagcc atgtatgggt ctgcacataa cacattcgta ctgtattgat aagaagcacg 1324

taccacttaa atacgcagat cgaaacgtct tgatttttt                       1362


<210> 2
<211> 314
<212> PRT
<213> Zea mays

<400> 2
Met Ala Thr Ser Ser Lys Pro Ala Ala Pro Val Asp Pro Met Val Val
  1               5                  10                  15

Leu Ala His Glu Phe Pro Glu Val Ser Phe Asp Tyr Asp Glu Arg Asp
             20                  25                  30

Val Ala Leu Tyr Ala Leu Gly Val Gly Ala Cys Gly Asp Asp Ala Val
         35                  40                  45

Asp Glu Lys Glu Leu His Phe Val Tyr His Arg Asp Gly Gln Pro His
     50                  55                  60

Ile Lys Thr Leu Pro Thr Phe Val Ser Leu Phe Pro Asn Lys Asn Ser
 65                  70                  75                  80

Asn Gly Leu Gly Phe Val Asp Val Pro Gly Leu Asn Phe Asp Ala Ser
                 85                  90                  95

Leu Leu Leu His Gly Gln Gln Tyr Ile Glu Ile Tyr Arg Pro Ile Pro
            100                 105                 110

Ser Tyr Val Ser Val Val Asn Arg Val Lys Val Val Gly Leu His Asp
        115                 120                 125

Lys Gly Lys Ala Thr Ile Leu Glu Leu Glu Thr Thr Thr Ser Leu Lys
    130                 135                 140

Glu Ser Gly Glu Ile Leu Cys Met Asn Arg Ser Thr Ile Tyr Leu Arg
145                 150                 155                 160

Gly Ala Gly Gly Phe Ser Asp Ser Ser Arg Pro Tyr Ser Tyr Ala Thr
                165                 170                 175

Tyr Pro Ala Asn Gln Val Ser Arg Ile Ser Ile Pro Asn Ser Ala Pro
            180                 185                 190

Ser Ala Val Cys Asp Asp Gln Thr Lys Gln Ser Gln Ala Leu Leu Tyr
        195                 200                 205

Arg Leu Ser Gly Asp Tyr Asn Pro Leu His Ser Asp Pro Asp Ile Ala
    210                 215                 220

Gln Leu Ala Gly Phe Thr Arg Pro Ile Leu His Gly Leu Cys Thr Leu
```

```
225                 230                 235                 240

Gly Phe Ala Ala Arg Ala Val Ile Lys Ser Phe Cys Asn Gly Glu Pro
                245                 250                 255

Thr Ala Val Lys Ser Ile Phe Gly Arg Phe Leu Leu His Val Tyr Pro
            260                 265                 270

Gly Glu Thr Leu Ser Thr Glu Met Trp Leu Asp Gly Gln Lys Val His
        275                 280                 285

Tyr Gln Thr Lys Ala Lys Glu Arg Asn Arg Ala Val Leu Ser Gly Tyr
    290                 295                 300

Val Leu Leu Gln His Ile Pro Ser Ser Leu
305                 310
```

<210> 3
<211> 3252
<212> DNA
<213> Saccharomyces cerevisiae

<400> 3

```
tagaactctc ggcggttatt tgccaatttt tactccaacg gggatcaaca tcagcaagaa 60
agcaaaggag gatggggtaa aaaaacaagg aagacaagta aagaaattat ataagaagtc 120
gtttctggct gctttactcc cagtgttgaa aggtagaagg acttatcagc taatttatta 180
agcaaggtac acatatacga gctaaacaaa cattcgattt atttcttatt tgagtaagcc 240
atgcctggaa atttatcctt caaagataga gttgttgtaa tcacgggcgc tggagggggc 300
ttaggtaagg tgtatgcact agcttacgca agcagaggtg caaaagtggt cgtcaatgat 360
ctaggtggca ctttgggtgg ttcaggacat aactccaaag ctgcagactt agtggtggat 420
gagataaaaa aagccggagg tatagctgtg gcaaattacg actctgttaa tgaaaatgga 480
gagaaaataa ttgaaacggc tataaaagaa ttcggcaggg ttgatgtact aattaacaac 540
gctggaatat taagggatgt ttcatttgca aagatgacag aacgtgagtt tgcatctgtg 600
gtagatgttc atttgacagg tggctataag ctatcgcgtg ctgcttggcc ttatatgcgc 660
tctcagaaat ttggtagaat cattaacacc gcttcccctg ccggtctatt tggaaatttt 720
ggtcaagcta attattcagc agctaaaatg ggcttagttg gtttggcgga aacccctgcg 780
aaggagggtg ccaaatacaa cattaatgtt aattcaattg cgccattggc tagatcacgt 840
atgacagaaa acgtgttacc accacatatc ttgaaacagt taggaccgga aaaaattgtt 900
cccttagtac tctatttgac acacgaaagt acgaaagtgt caaactccat ttttgaactc 960
gctgctggat tctttggaca gctcagatgg gagaggtctt ctggacaaat tttcaatcca 1020
gaccccaaga catatactcc tgaagcaatt ttaaataagt ggaaggaaat cacagactat 1080
agggacaagc catttaacaa aactcagcat ccatatcaac tctcggatta taatgattta 1140
atcaccaaag caaaaaaatt acctcccaat gaacaaggct cagtgaaaat caagtcgctt 1200
tgcaacaaag tcgtagtagt tacgggtgca ggaggtggtc ttgggaagtc tcatgcaatc 1260
tggtttgcac ggtacggtgc gaaggtagtt gtaaatgaca tcaaggatcc tttttcagtt 1320
gttgaagaaa taaataaact atatggtgaa ggcacagcca ttccagattc ccatgatgtg 1380
gtcaccgaag ctcctctcat tatccaaact gcaataagta agtttcagag agtagacatc 1440
ttggtcaata acgctggtat tttgcgtgac aaatcttttt taaaaatgaa agatgaggaa 1500
tggttttgct tcctgaaagt ccaccttttt tccacatttt cattgtcaaa agcagtatgg 1560
ccaatatttc ccaaacaaaa gtctggattt attatcaata ctacttctac ctcaggaatt 1620
tatggtaatt ttggacaggc caattatgcc gctgcaaaag ccgccatttt aggattcagt 1680
aaaactattg cactggaagg tgccaagaga ggaattattg ttaatgttat cgctcctcat 1740
gcagaaacgg ctatgacaaa gactatattc tcggagaagg aattatcaaa ccactttgat 1800
gcatctcaag tctccccact tgttgttttg ttggcatctg aagaactaca aaagtattct 1860
ggaagaaggg ttattggcca attattcgaa gttggcggtg gttggtgtgg gcaaaccaga 1920
tggcaaagaa gttccggtta tgtttctatt aaagagacta ttgaaccgga agaaattaaa 1980
gaaaattgga accacatcac tgatttcagt cgcaacacta tcaaccggag ctccacagag 2040
gagtctttct tggcaacctt gcaagccgtg caaaaagcgc actcttcaaa ggagttggat 2100
```

```
gatggattat tcaagtacac taccaaggat tgtatcttgt acaatttagg acttggatgc 2160
acaagcaaag agcttaagta cacctacgag aatgatccag acttccaagt tttgcccacg 2220
ttcgccgtca ttccatttat gcaagctact gccacactag ctatggacaa tttagtcgat 2280
aacttcaatt atgcaatgtt actgcatgga gaacaatatt ttaagctctg cacgccgaca 2340
atgccaagta atggaactct aaagacactt gctaaacctt tacaagtact tgacaagaat 2400
ggtaaagccg ctttagttgt tggtggcttc gaaacttatg acattaaaac taagaaactc 2460
atagcttata acgaaggatc gttcttcatc aggggcgcac atgtacctcc agaaaaggaa 2520
gtgagggatg ggaaaagagc caagtttgct gtccaaaatt ttgaagtgcc acatggaaag 2580
gtaccagatt ttgaggcgga gatttctacg aataaagatc aagccgcatt gtacaggtta 2640
tctggcgatt tcaatcctct acatatcgat cccacgctag ccaaagcagt taaatttcct 2700
acgccaattc tgcatgggct ttgtacatta ggtattagtg cgaaagcatt gtttgaacat 2760
tatggtccat atgaggagtt gaaagtgaga tttaccaatg ttgtttttcc aggtgatact 2820
ctaaaggtta aagcttggaa gcaaggctcg gttgtcgttt ttcaaacaat tgatacgacc 2880
agaaacgtca ttgtattgga taacgccgct gtaaaactat cgcaggcaaa atctaaacta 2940
taatacaaaa aaagatttga ataatataaa aaatagcgat tatattcttt tcatttaaca 3000
gctttgttaa gccatatcct tacatacatc tttccctaca taactaacct acccatttta 3060
agtacttttt ctttacggac gcaacttttt tgtcatgtgt aatattaaca gttttaatct 3120
atatagagga agaggatgga taatattaca aagtgtatat aggttgtata tagatacatg 3180
catatgatgg gaagactatg aagagagaga tagtcatcat ggtaagacat ttatccagaa 3240
attcatgaat tc                                                    3252
```

<210> 4
<211> 1566
<212> DNA
<213> Saccharomyces cerevisiae

<220>
<221> CDS
<222> (1)..(1563)

<220>
<223> Nucleotides 4-1566 of SEQ ID NO: 4 corresponds to nucleotides 1381-2943 of SEQ ID NO: 3.

<400> 4

```
atg gtc acc gaa gct cct ctc att atc caa act gca ata agt aag ttt   48
Met Val Thr Glu Ala Pro Leu Ile Ile Gln Thr Ala Ile Ser Lys Phe
  1               5                  10                  15

cag aga gta gac atc ttg gtc aat aac gct ggt att ttg cgt gac aaa   96
Gln Arg Val Asp Ile Leu Val Asn Asn Ala Gly Ile Leu Arg Asp Lys
            20                  25                  30

tct ttt tta aaa atg aaa gat gag gaa tgg ttt gct gtc ctg aaa gtc   144
Ser Phe Leu Lys Met Lys Asp Glu Glu Trp Phe Ala Val Leu Lys Val
        35                  40                  45

cac ctt ttt tcc aca ttt tca ttg tca aaa gca gta tgg cca ata ttt   192
His Leu Phe Ser Thr Phe Ser Leu Ser Lys Ala Val Trp Pro Ile Phe
    50                  55                  60

acc aaa caa aag tct gga ttt att atc aat act act tct acc tca gga   240
Thr Lys Gln Lys Ser Gly Phe Ile Ile Asn Thr Thr Ser Thr Ser Gly
65                  70                  75                  80

att tat ggt aat ttt gga cag gcc aat tat gcc gct gca aaa gcc gcc   288
Ile Tyr Gly Asn Phe Gly Gln Ala Asn Tyr Ala Ala Ala Lys Ala Ala
                85                  90                  95
```

```
att tta gga ttc agt aaa act att gca ctg gaa ggt gcc aag aga gga   336
Ile Leu Gly Phe Ser Lys Thr Ile Ala Leu Glu Gly Ala Lys Arg Gly
            100                 105                 110

att att gtt aat gtt atc gct cct cat gca gaa acg gct atg aca aag   384
Ile Ile Val Asn Val Ile Ala Pro His Ala Glu Thr Ala Met Thr Lys
        115                 120                 125

act ata ttc tcg gag aag gaa tta tca aac cac ttt gat gca tct caa   432
Thr Ile Phe Ser Glu Lys Glu Leu Ser Asn His Phe Asp Ala Ser Gln
    130                 135                 140

gtc tcc cca ctt gtt gtt ttg ttg gca tct gaa gaa cta caa aag tat   480
Val Ser Pro Leu Val Val Leu Leu Ala Ser Glu Glu Leu Gln Lys Tyr
145                 150                 155                 160

tct gga aga agg gtt att ggc caa tta ttc gaa gtt ggc ggt ggt tgg   528
Ser Gly Arg Arg Val Ile Gly Gln Leu Phe Glu Val Gly Gly Gly Trp
                165                 170                 175

tgt ggg caa acc aga tgg caa aga agt tcc ggt tat gtt tct att aaa   576
Cys Gly Gln Thr Arg Trp Gln Arg Ser Ser Gly Tyr Val Ser Ile Lys
            180                 185                 190

gag act att gaa ccg gaa gaa att aaa gaa aat tgg aac cac atc act   624
Glu Thr Ile Glu Pro Glu Glu Ile Lys Glu Asn Trp Asn His Ile Thr
        195                 200                 205

gat ttc agt cgc aac act atc aac ccg agc tcc aca gag gag tct tct   672
Asp Phe Ser Arg Asn Thr Ile Asn Pro Ser Ser Thr Glu Glu Ser Ser
    210                 215                 220

atg gca acc ttg caa gcc gtg caa aaa gcg cac tct tca aag gag ttg   720
Met Ala Thr Leu Gln Ala Val Gln Lys Ala His Ser Ser Lys Glu Leu
225                 230                 235                 240

gat gat gga tta ttc aag tac act acc aag gat tgt atc ttg tac aat   768
Asp Asp Gly Leu Phe Lys Tyr Thr Thr Lys Asp Cys Ile Leu Tyr Asn
                245                 250                 255

tta gga ctt gga tgc aca agc aaa gag ctt aag tac acc tac gag aat   816
Leu Gly Leu Gly Cys Thr Ser Lys Glu Leu Lys Tyr Thr Tyr Glu Asn
            260                 265                 270

gat cca gac ttc caa gtt ttg ccc acg ttc gcc gtc att cca ttt atg   864
Asp Pro Asp Phe Gln Val Leu Pro Thr Phe Ala Val Ile Pro Phe Met
        275                 280                 285

caa gct act gcc aca cta gct atg gac aat tta gtc gat aac ttc aat   912
Gln Ala Thr Ala Thr Leu Ala Met Asp Asn Leu Val Asp Asn Phe Asn
    290                 295                 300

tat gca atg tta ctg cat gga gaa caa tat ttt aag ctc tgc acg ccg   960
Tyr Ala Met Leu Leu His Gly Glu Gln Tyr Phe Lys Leu Cys Thr Pro
305                 310                 315                 320

aca atg cca agt aat gga act cta aag aca ctt gct aaa cct tta caa  1008
Thr Met Pro Ser Asn Gly Thr Leu Lys Thr Leu Ala Lys Pro Leu Gln
                325                 330                 335
```

```
gta ctt gac aag aat ggt aaa gcc gct tta gtt gtt ggt ggc ttc gaa   1056
Val Leu Asp Lys Asn Gly Lys Ala Ala Leu Val Val Gly Gly Phe Glu
            340                 345                 350

act tat gac att aaa act aag aaa ctc ata gct tat aac gaa gga tcg   1104
Thr Tyr Asp Ile Lys Thr Lys Lys Leu Ile Ala Tyr Asn Glu Gly Ser
        355                 360                 365

ttc ttc atc agg ggc gca cat gta cct cca gaa aag gaa gtg agg gat   1152
Phe Phe Ile Arg Gly Ala His Val Pro Pro Glu Lys Glu Val Arg Asp
    370                 375                 380

ggg aaa aga gcc aag ttt gct gtc caa aat ttt gaa gtg cca cat gga   1200
Gly Lys Arg Ala Lys Phe Ala Val Gln Asn Phe Glu Val Pro His Gly
385                 390                 395                 400

aag gta cca gat ttt gag gcg gag att tct acg aat aaa gat caa gcc   1248
Lys Val Pro Asp Phe Glu Ala Glu Ile Ser Thr Asn Lys Asp Gln Ala
                405                 410                 415

gca ttg tac agg tta tct ggc gat ttc aat cct tta cat atc gat ccc   1296
Ala Leu Tyr Arg Leu Ser Gly Asp Phe Asn Pro Leu His Ile Asp Pro
            420                 425                 430

acg cta gcc aaa gca gtt aaa ttt cct acg cca att ctg cat ggg ctt   1344
Thr Leu Ala Lys Ala Val Lys Phe Pro Thr Pro Ile Leu His Gly Leu
        435                 440                 445

tgt aca tta ggt att agt gcg aaa gca ttg ttt gaa cat tat ggt cca   1392
Cys Thr Leu Gly Ile Ser Ala Lys Ala Leu Phe Glu His Tyr Gly Pro
    450                 455                 460

tat gag gag ttg aaa gtg aga ttt acc aat gtt gtt ttc cca ggt gat   1440
Tyr Glu Glu Leu Lys Val Arg Phe Thr Asn Val Val Phe Pro Gly Asp
465                 470                 475                 480

act cta aag gtt aaa gct tgg aag caa ggc tcg gtt gtc gtt ttt caa   1488
Thr Leu Lys Val Lys Ala Trp Lys Gln Gly Ser Val Val Val Phe Gln
                485                 490                 495

aca att gat acg acc aga aac gtc att gta ttg gat aac gcc gct gta   1536
Thr Ile Asp Thr Thr Arg Asn Val Ile Val Leu Asp Asn Ala Ala Val
            500                 505                 510

aaa cta tcg cag gca aaa tct aaa cta taa                           1566
Lys Leu Ser Gln Ala Lys Ser Lys Leu
        515                 520
```

<210> 5
<211> 521
<212> PRT
<213> Saccharomyces cerevisiae
<223> Nucleotides 4-1566 of SEQ ID NO: 4 corresponds to nucleotides 1381-2943 of SEQ ID NO: 3.

<400> 5

```
Met Val Thr Glu Ala Pro Leu Ile Ile Gln Thr Ala Ile Ser Lys Phe
  1               5                  10                  15
```

```
Gln Arg Val Asp Ile Leu Val Asn Asn Ala Gly Ile Leu Arg Asp Lys
            20                  25                  30

Ser Phe Leu Lys Met Lys Asp Glu Glu Trp Phe Ala Val Leu Lys Val
        35                  40                  45

His Leu Phe Ser Thr Phe Ser Leu Ser Lys Ala Val Trp Pro Ile Phe
    50                  55                  60

Thr Lys Gln Lys Ser Gly Phe Ile Ile Asn Thr Thr Ser Thr Ser Gly
65                  70                  75                  80

Ile Tyr Gly Asn Phe Gly Gln Ala Asn Tyr Ala Ala Ala Lys Ala Ala
                85                  90                  95

Ile Leu Gly Phe Ser Lys Thr Ile Ala Leu Glu Gly Ala Lys Arg Gly
            100                 105                 110

Ile Ile Val Asn Val Ile Ala Pro His Ala Glu Thr Ala Met Thr Lys
        115                 120                 125

Thr Ile Phe Ser Glu Lys Glu Leu Ser Asn His Phe Asp Ala Ser Gln
    130                 135                 140

Val Ser Pro Leu Val Val Leu Leu Ala Ser Glu Glu Leu Gln Lys Tyr
145                 150                 155                 160

Ser Gly Arg Arg Val Ile Gly Gln Leu Phe Glu Val Gly Gly Gly Trp
                165                 170                 175

Cys Gly Gln Thr Arg Trp Gln Arg Ser Ser Gly Tyr Val Ser Ile Lys
            180                 185                 190

Glu Thr Ile Glu Pro Glu Glu Ile Lys Glu Asn Trp Asn His Ile Thr
        195                 200                 205

Asp Phe Ser Arg Asn Thr Ile Asn Pro Ser Ser Thr Glu Glu Ser Ser
    210                 215                 220

Met Ala Thr Leu Gln Ala Val Gln Lys Ala His Ser Ser Lys Glu Leu
225                 230                 235                 240

Asp Asp Gly Leu Phe Lys Tyr Thr Thr Lys Asp Cys Ile Leu Tyr Asn
                245                 250                 255

Leu Gly Leu Gly Cys Thr Ser Lys Glu Leu Lys Tyr Thr Tyr Glu Asn
            260                 265                 270

Asp Pro Asp Phe Gln Val Leu Pro Thr Phe Ala Val Ile Pro Phe Met
        275                 280                 285

Gln Ala Thr Ala Thr Leu Ala Met Asp Asn Leu Val Asp Asn Phe Asn
    290                 295                 300

Tyr Ala Met Leu Leu His Gly Glu Gln Tyr Phe Lys Leu Cys Thr Pro
305                 310                 315                 320

Thr Met Pro Ser Asn Gly Thr Leu Lys Thr Leu Ala Lys Pro Leu Gln
                325                 330                 335
```

```
Val Leu Asp Lys Asn Gly Lys Ala Ala Leu Val Val Gly Gly Phe Glu
            340                 345                 350

Thr Tyr Asp Ile Lys Thr Lys Lys Leu Ile Ala Tyr Asn Glu Gly Ser
        355                 360                 365

Phe Phe Ile Arg Gly Ala His Val Pro Pro Glu Lys Glu Val Arg Asp
    370                 375                 380

Gly Lys Arg Ala Lys Phe Ala Val Gln Asn Phe Glu Val Pro His Gly
385                 390                 395                 400

Lys Val Pro Asp Phe Glu Ala Glu Ile Ser Thr Asn Lys Asp Gln Ala
                405                 410                 415

Ala Leu Tyr Arg Leu Ser Gly Asp Phe Asn Pro Leu His Ile Asp Pro
            420                 425                 430

Thr Leu Ala Lys Ala Val Lys Phe Pro Thr Pro Ile Leu His Gly Leu
        435                 440                 445

Cys Thr Leu Gly Ile Ser Ala Lys Ala Leu Phe Glu His Tyr Gly Pro
    450                 455                 460

Tyr Glu Glu Leu Lys Val Arg Phe Thr Asn Val Val Phe Pro Gly Asp
465                 470                 475                 480

Thr Leu Lys Val Lys Ala Trp Lys Gln Gly Ser Val Val Val Phe Gln
                485                 490                 495

Thr Ile Asp Thr Thr Arg Asn Val Ile Val Leu Asp Asn Ala Ala Val
            500                 505                 510

Lys Leu Ser Gln Ala Lys Ser Lys Leu
        515                 520
```

<210> 6
<211> 1887
<212> DNA
<213> Saccharomyces cerevisiae

<220>
<221> CDS
<222> (1)..(1887)

<220>
<223> Nucleotides 1-1887 of SEQ ID NO: 6 corresponds to nucleotides 241- 2127 of SEQ ID NO: 3.

<400> 6

```
atg cct gga aat tta tcc ttc aaa gat aga gtt gtt gta atc acg ggc   48
Met Pro Gly Asn Leu Ser Phe Lys Asp Arg Val Val Val Ile Thr Gly
  1               5                  10                  15

gct gga ggg ggc tta ggt aag gtg tat gca cta gct tac gca agc aga   96
Ala Gly Gly Gly Leu Gly Lys Val Tyr Ala Leu Ala Tyr Ala Ser Arg
             20                  25                  30
```

```
ggt gca aaa gtg gtc gtc aat gat cta ggt ggc act ttg ggt ggt tca   144
Gly Ala Lys Val Val Val Asn Asp Leu Gly Gly Thr Leu Gly Gly Ser
         35                  40                  45

gga cat aac tcc aaa gct gca gac tta gtg gtg gat gag ata aaa aaa   192
Gly His Asn Ser Lys Ala Ala Asp Leu Val Val Asp Glu Ile Lys Lys
     50                  55                  60

gcc gga ggt ata gct gtg gca aat tac gac tct gtt aat gaa aat gga   240
Ala Gly Gly Ile Ala Val Ala Asn Tyr Asp Ser Val Asn Glu Asn Gly
 65                  70                  75                  80

gag aaa ata att gaa acg gct ata aaa gaa ttc ggc agg gtt gat gta   288
Glu Lys Ile Ile Glu Thr Ala Ile Lys Glu Phe Gly Arg Val Asp Val
                 85                  90                  95

cta att aac aac gct gga ata tta agg gat gtt tca ttt gca aag atg   336
Leu Ile Asn Asn Ala Gly Ile Leu Arg Asp Val Ser Phe Ala Lys Met
            100                 105                 110

aca gaa cgt gag ttt gca tct gtg gta gat gtt cat ttg aca ggt ggc   384
Thr Glu Arg Glu Phe Ala Ser Val Val Asp Val His Leu Thr Gly Gly
        115                 120                 125

tat aag cta tcg cgt gct gct tgg cct tat atg cgc tct cag aaa ttt   432
Tyr Lys Leu Ser Arg Ala Ala Trp Pro Tyr Met Arg Ser Gln Lys Phe
    130                 135                 140

ggt aga atc att aac acc gct tcc cct gcc ggt cta ttt gga aat ttt   480
Gly Arg Ile Ile Asn Thr Ala Ser Pro Ala Gly Leu Phe Gly Asn Phe
145                 150                 155                 160

ggt caa gct aat tat tca gca gct aaa atg ggc tta gtt ggt ttg gcg   528
Gly Gln Ala Asn Tyr Ser Ala Ala Lys Met Gly Leu Val Gly Leu Ala
                165                 170                 175

gaa acc ctc gcg aag gag ggt gcc aaa tac aac att aat gtt aat tca   576
Glu Thr Leu Ala Lys Glu Gly Ala Lys Tyr Asn Ile Asn Val Asn Ser
            180                 185                 190

att gcg cca ttg gct aga tca cgt atg aca gaa aac gtg tta cca cca   624
Ile Ala Pro Leu Ala Arg Ser Arg Met Thr Glu Asn Val Leu Pro Pro
        195                 200                 205

cat atc ttg aaa cag tta gga ccg gaa aaa att gtt ccc tta gta ctc   672
His Ile Leu Lys Gln Leu Gly Pro Glu Lys Ile Val Pro Leu Val Leu
    210                 215                 220

tat ttg aca cac gaa agt acg aaa gtg tca aac tcc att ttt gaa ctc   720
Tyr Leu Thr His Glu Ser Thr Lys Val Ser Asn Ser Ile Phe Glu Leu
225                 230                 235                 240

gct gct gga ttc ttt gga cag ctc aga tgg gag agg tct tct gga caa   768
Ala Ala Gly Phe Phe Gly Gln Leu Arg Trp Glu Arg Ser Ser Gly Gln
                245                 250                 255

att ttc aat cca gac ccc aag aca tat act cct gaa gca att tta aat   816
Ile Phe Asn Pro Asp Pro Lys Thr Tyr Thr Pro Glu Ala Ile Leu Asn
            260                 265                 270
```

```
aag tgg aag gaa atc aca gac tat agg gac aag cca ttt aac aaa act   864
Lys Trp Lys Glu Ile Thr Asp Tyr Arg Asp Lys Pro Phe Asn Lys Thr
        275                 280                 285

cag cat cca tat caa ctc tcg gat tat aat gat tta atc acc aaa gca   912
Gln His Pro Tyr Gln Leu Ser Asp Tyr Asn Asp Leu Ile Thr Lys Ala
    290                 295                 300

aaa aaa tta cct ccc aat gaa caa ggc tca gtg aaa atc aag tcg ctt   960
Lys Lys Leu Pro Pro Asn Glu Gln Gly Ser Val Lys Ile Lys Ser Leu
305                 310                 315                 320

tgc aac aaa gtc gta gta gtt acg ggt gca gga ggt ggt ctt ggg aag  1008
Cys Asn Lys Val Val Val Val Thr Gly Ala Gly Gly Gly Leu Gly Lys
                325                 330                 335

tct cat gca atc tgg ttt gca cgg tac ggt gcg aag gta gtt gta aat  1056
Ser His Ala Ile Trp Phe Ala Arg Tyr Gly Ala Lys Val Val Val Asn
            340                 345                 350

gac atc aag gat cct ttt tca gtt gtt gaa gaa ata aat aaa cta tat  1104
Asp Ile Lys Asp Pro Phe Ser Val Val Glu Glu Ile Asn Lys Leu Tyr
        355                 360                 365

ggt gaa ggc aca gcc att cca gat tcc cat gat gtg gtc acc gaa gct  1152
Gly Glu Gly Thr Ala Ile Pro Asp Ser His Asp Val Val Thr Glu Ala
    370                 375                 380

cct ctc att atc caa act gca ata agt aag ttt cag aga gta gac atc  1200
Pro Leu Ile Ile Gln Thr Ala Ile Ser Lys Phe Gln Arg Val Asp Ile
385                 390                 395                 400

ttg gtc aat aac gct ggt att ttg cgt gac aaa tct ttt tta aaa atg  1248
Leu Val Asn Asn Ala Gly Ile Leu Arg Asp Lys Ser Phe Leu Lys Met
                405                 410                 415

aaa gat gag gaa tgg ttt gct gtc ctg aaa gtc cac ctt ttt tcc aca  1296
Lys Asp Glu Glu Trp Phe Ala Val Leu Lys Val His Leu Phe Ser Thr
            420                 425                 430

ttt tca ttg tca aaa gca gta tgg cca ata ttt acc aaa caa aag tct  1344
Phe Ser Leu Ser Lys Ala Val Trp Pro Ile Phe Thr Lys Gln Lys Ser
        435                 440                 445

gga ttt att atc aat act act tct acc tca gga att tat ggt aat ttt  1392
Gly Phe Ile Ile Asn Thr Thr Ser Thr Ser Gly Ile Tyr Gly Asn Phe
    450                 455                 460

gga cag gcc aat tat gcc gct gca aaa gcc gcc att tta gga ttc agt  1440
Gly Gln Ala Asn Tyr Ala Ala Ala Lys Ala Ala Ile Leu Gly Phe Ser
465                 470                 475                 480

aaa act att gca ctg gaa ggt gcc aag aga gga att att gtt aat gtt  1488
Lys Thr Ile Ala Leu Glu Gly Ala Lys Arg Gly Ile Ile Val Asn Val
                485                 490                 495

atc gct cct cat gca gaa acg gct atg aca aag act ata ttc tcg gag  1536
Ile Ala Pro His Ala Glu Thr Ala Met Thr Lys Thr Ile Phe Ser Glu
            500                 505                 510
```

```
aag gaa tta tca aac cac ttt gat gca tct caa gtc tcc cca ctt gtt   1584
Lys Glu Leu Ser Asn His Phe Asp Ala Ser Gln Val Ser Pro Leu Val
        515                 520                 525

gtt ttg ttg gca tct gaa gaa cta caa aag tat tct gga aga agg gtt   1632
Val Leu Leu Ala Ser Glu Glu Leu Gln Lys Tyr Ser Gly Arg Arg Val
    530                 535                 540

att ggc caa tta ttc gaa gtt ggc ggt ggt tgg tgt ggg caa acc aga   1680
Ile Gly Gln Leu Phe Glu Val Gly Gly Gly Trp Cys Gly Gln Thr Arg
545                 550                 555                 560

tgg caa aga agt tcc ggt tat gtt tct att aaa gag act att gaa ccg   1728
Trp Gln Arg Ser Ser Gly Tyr Val Ser Ile Lys Glu Thr Ile Glu Pro
                565                 570                 575

gaa gaa att aaa gaa aat tgg aac cac atc act gat ttc agt cgc aac   1776
Glu Glu Ile Lys Glu Asn Trp Asn His Ile Thr Asp Phe Ser Arg Asn
            580                 585                 590

act atc aac ccg agc tcc aca gag gag tct tct atg gca acc ttg caa   1824
Thr Ile Asn Pro Ser Ser Thr Glu Glu Ser Ser Met Ala Thr Leu Gln
        595                 600                 605

gcc gtg caa aaa gcg cac tct tca aag gag ttg gat gat gga tta ttc   1872
Ala Val Gln Lys Ala His Ser Ser Lys Glu Leu Asp Asp Gly Leu Phe
    610                 615                 620

aag tac act acc aag                                              1887
Lys Tyr Thr Thr Lys
625
```

<210> 7
<211> 629
<212> PRT
<213> Saccharomyces cerevisiae
<223> Nucleotides 1-1887 of SEQ ID NO: 6 corresponds to nucleotides 241- 2127 of SEQ ID NO: 3.

<400> 7

```
Met Pro Gly Asn Leu Ser Phe Lys Asp Arg Val Val Val Ile Thr Gly
  1               5                  10                  15

Ala Gly Gly Gly Leu Gly Lys Val Tyr Ala Leu Ala Tyr Ala Ser Arg
             20                  25                  30

Gly Ala Lys Val Val Val Asn Asp Leu Gly Gly Thr Leu Gly Gly Ser
         35                  40                  45

Gly His Asn Ser Lys Ala Ala Asp Leu Val Val Asp Glu Ile Lys Lys
     50                  55                  60

Ala Gly Gly Ile Ala Val Ala Asn Tyr Asp Ser Val Asn Glu Asn Gly
 65                  70                  75                  80

Glu Lys Ile Ile Glu Thr Ala Ile Lys Glu Phe Gly Arg Val Asp Val
                 85                  90                  95

Leu Ile Asn Asn Ala Gly Ile Leu Arg Asp Val Ser Phe Ala Lys Met
```

```
                100                 105                 110

Thr Glu Arg Glu Phe Ala Ser Val Val Asp Val His Leu Thr Gly Gly
        115                 120                 125

Tyr Lys Leu Ser Arg Ala Ala Trp Pro Tyr Met Arg Ser Gln Lys Phe
    130                 135                 140

Gly Arg Ile Ile Asn Thr Ala Ser Pro Ala Gly Leu Phe Gly Asn Phe
145                 150                 155                 160

Gly Gln Ala Asn Tyr Ser Ala Ala Lys Met Gly Leu Val Gly Leu Ala
                165                 170                 175

Glu Thr Leu Ala Lys Glu Gly Ala Lys Tyr Asn Ile Asn Val Asn Ser
            180                 185                 190

Ile Ala Pro Leu Ala Arg Ser Arg Met Thr Glu Asn Val Leu Pro Pro
        195                 200                 205

His Ile Leu Lys Gln Leu Gly Pro Glu Lys Ile Val Pro Leu Val Leu
    210                 215                 220

Tyr Leu Thr His Glu Ser Thr Lys Val Ser Asn Ser Ile Phe Glu Leu
225                 230                 235                 240

Ala Ala Gly Phe Phe Gly Gln Leu Arg Trp Glu Arg Ser Ser Gly Gln
                245                 250                 255

Ile Phe Asn Pro Asp Pro Lys Thr Tyr Thr Pro Glu Ala Ile Leu Asn
            260                 265                 270

Lys Trp Lys Glu Ile Thr Asp Tyr Arg Asp Lys Pro Phe Asn Lys Thr
        275                 280                 285

Gln His Pro Tyr Gln Leu Ser Asp Tyr Asn Asp Leu Ile Thr Lys Ala
    290                 295                 300

Lys Lys Leu Pro Pro Asn Glu Gln Gly Ser Val Lys Ile Lys Ser Leu
305                 310                 315                 320

Cys Asn Lys Val Val Val Val Thr Gly Ala Gly Gly Gly Leu Gly Lys
                325                 330                 335

Ser His Ala Ile Trp Phe Ala Arg Tyr Gly Ala Lys Val Val Val Asn
            340                 345                 350

Asp Ile Lys Asp Pro Phe Ser Val Val Glu Glu Ile Asn Lys Leu Tyr
        355                 360                 365

Gly Glu Gly Thr Ala Ile Pro Asp Ser His Asp Val Val Thr Glu Ala
    370                 375                 380

Pro Leu Ile Ile Gln Thr Ala Ile Ser Lys Phe Gln Arg Val Asp Ile
385                 390                 395                 400

Leu Val Asn Asn Ala Gly Ile Leu Arg Asp Lys Ser Phe Leu Lys Met
                405                 410                 415

Lys Asp Glu Glu Trp Phe Ala Val Leu Lys Val His Leu Phe Ser Thr
```

```
            420                 425                 430

Phe Ser Leu Ser Lys Ala Val Trp Pro Ile Phe Thr Lys Gln Lys Ser
        435                 440                 445

Gly Phe Ile Ile Asn Thr Thr Ser Thr Ser Gly Ile Tyr Gly Asn Phe
    450                 455                 460

Gly Gln Ala Asn Tyr Ala Ala Ala Lys Ala Ala Ile Leu Gly Phe Ser
465                 470                 475                 480

Lys Thr Ile Ala Leu Glu Gly Ala Lys Arg Gly Ile Ile Val Asn Val
                485                 490                 495

Ile Ala Pro His Ala Glu Thr Ala Met Thr Lys Thr Ile Phe Ser Glu
            500                 505                 510

Lys Glu Leu Ser Asn His Phe Asp Ala Ser Gln Val Ser Pro Leu Val
        515                 520                 525

Val Leu Leu Ala Ser Glu Glu Leu Gln Lys Tyr Ser Gly Arg Arg Val
    530                 535                 540

Ile Gly Gln Leu Phe Glu Val Gly Gly Gly Trp Cys Gly Gln Thr Arg
545                 550                 555                 560

Trp Gln Arg Ser Ser Gly Tyr Val Ser Ile Lys Glu Thr Ile Glu Pro
                565                 570                 575

Glu Glu Ile Lys Glu Asn Trp Asn His Ile Thr Asp Phe Ser Arg Asn
            580                 585                 590

Thr Ile Asn Pro Ser Ser Thr Glu Glu Ser Ser Met Ala Thr Leu Gln
        595                 600                 605

Ala Val Gln Lys Ala His Ser Ser Lys Glu Leu Asp Asp Gly Leu Phe
    610                 615                 620

Lys Tyr Thr Thr Lys
625
```

<210> 8
<211> 6455
<212> DNA
<213> Pseudomonas oleovorans

<400> 8

```
gaattcctgc gcgtgcactc ccccteegcc gaggtccagg gccacggtaa ccccatcctg 60
cagttcggca agatcaacgt cggcctcagc ggcctggaac ctgccgggca atacgcactg 120
aaactgacct tcgacgacgg ccatgacagc ggcctgttca cctgggaata cctcgagcag 180
ctgtgcctgc gccaggaaca gctgtgggcc gagtacctcg acgaactgca caaggccggg 240
aaatccegcg accctgccga gtcggtggtc aaactcatgc tctagcgcaa ggcctgcagg 300
atttagagcg cattttctaa aatcatctgt ttgaatgact tacagacagc ccagtgacgg 360
gctgtcttgc gcattacatg aaagtcgggt aaccaatggg ggtggcaagt tccctgcatc 420
aaattgcagg tagtcagaac cctcgcagca ccgctgttcc ttatcactgg tcacccgagt 480
agcagtaccg ggctcagaac tgtgcaccog ccacagcaac cggtactcgt ctcaggacaa 540
cggagcgtcg tagatgagta acaagaacaa cgatgagctg cagcggcagg cctcggaaaa 600
cacccctgggg ctgaacccgg tcatcggtat ccgccgcaaa gacctgttga gctcggcacg 660
```

```
caccgtgctg cgccaggccg tgcgccaacc gctgcacagc gccaagcatg tggcccactt 720
tggcctggag ctgaagaacg tgctgctggg caagtccagc cttgcccccgg aaagcgacga 780
ccgtcgcttc aatgacccgg catggagcaa caacccactt taccgccgct acctgcaaac 840
ctatctggcc tggcgcaagg agctgcagga ctggatcggc aacagcgacc tgtcgccccca 900
ggacatcagc cgcggccagt tcgtcatcaa cctgatgacc gaagccatgg ctccgaccaa 960
cacctgtcc aacccggcag cagtcaaacg cttcttcgaa accggcggca agagcctgct 1020
cgatggcctg tccaacctgc ccaaggacct ggtcaacaac ggtggcatgc ccagccaggt 1080
gaacatggac gccttcgagg tgggcaagaa cctgggcacc agtgaaggcg ccgtggtgta 1140
ccgcaacgat gtgctggagc tgatccagta caagcccatc accgagcagg tgcatgcccg 1200
cccgctgctg gtggtgccgc cgcagatcaa caagttctac gtattcgacc tgagcccgga 1260
aaagagcctg gcacgctact gcctgcgctc gcagcagcag accttcatca tcagctggcg 1320
caacccgacc aaagcccagc gcgaatgggg cctgtccacc tacatcgacg cgctcaagga 1380
ggcggtcgac gcggtgctgg cgattaccgg cagcaaggac ctgaacatgc tcggtgcctg 1440
ctccggcggc atcacctgca cggcattggt cggccactat gccgccctcg gcgaaaacaa 1500
ggtcaatgcc ctgacctgc tggtcagcgt gctggacacc accatggaca accaggtcgc 1560
cctgttcgtc gacgagcaga ctttggaggc cgccaagcgc cactcctacc aggccggtgt 1620
gctcgaaggc agcgagatgg ccaaggtgtt cgcctggatg cgccccaacg acctgatctg 1680
gaactactgg gtcaacaact acctgctcgg caacgagccg ccggtgttcg acatcctgtt 1740
ctggaacaac gacaccacgc gcctgccggc cgccttccac ggcgacctga tcgaaatgtt 1800
caagagcaac ccgctgaccc gcccggacgc cctggaggtt tgcggcacta cgatcgacct 1860
gaaacaggtc aaatgcgaca tctacagcct tgccggcacc aacgaccaca tcaccccgtg 1920
gcagtcatgc taccgctcgg cgcacctgtt cggcggcaag atcgagttcg tgctgtccaa 1980
cagcggccac atccagagca tcctcaaccc gccaggcaac cccaaggcgc gcttcatgac 2040
cggtgccgat cgcccgggtg accccggtggc ctggcaggaa aacgccacca agcatgccga 2100
ctcctggtgg ctgcactggc aaagctggct gggcgagcgt gccggcgagc tggaaaaggc 2160
gccgacccgc ctgggcaacc gtgcctatgc cgctggcgag gcatccccgg gcacctacgt 2220
tcacgagcgt tgagctgcag cgccgtggcc acctgcgggа cgccacggtg ttcatttcac 2280
cccatgagtc acgcgcatgc cgcaaccctа catcttcagg accgtcgagc tggacaacca 2340
gtccatccgc accgccgtcc gccccgggcaa accgcacctg acgccgttgc tgatcttcaa 2400
cggcatcggt gccaacctgg agctggtgtt tccgttcatc gaggcactgg accccggacct 2460
ggaagtcatt gcctttgacg tacccggggt cggcggctcg tccacgccgc gccacccata 2520
ccgcttcccc gggttggcca agctgacggc acgcatgctc gactacctcg actacggcca 2580
ggtcaatgtc atcggtgtgt cttggggcgg cgccctggcc cagcagttcg cccacgatta 2640
ccccgaacgc tgcaagaaac tggtgctggc cgccaccgca gccggtgcgg tgatggtgcc 2700
aggcaagccc aaggtgttgt ggatgatggc cagcccacgg cgttacgtgc agccgtcgca 2760
tgtcatccgc attgcgccga cgatctatgg cggcggcttc cggcgtgacc ccgaactggc 2820
catgcagcac gcctccaagg tgcgctccgg cggcaagatg ggctactact ggcagctgtt 2880
cgccgggctc ggctggacca gcatccactg gctgcacaag atccagcaac cgaccctggt 2940
gctggccggc gacgacgacc cgctgatccc gctgatcaac atgcgcctgc tggcctggcg 3000
gattcccaat gcccagctac acattatcga cgacggtcat ttgttcctga tcacccgggc 3060
cgaggccgtc gccccgatca tcatgaagtt ccttcagcaa gaacgacagc gcgccgtcat 3120
gcaccctcgc ccggcttcgg gcgggtaaat cgatgcggcc ttcttcgcgg gcgcgcccgc 3180
tcccacaggg atggcgccga acctgtggga gcgggcatgc ccgcgaaggt ctcgacagcg 3240
aaatggctta gacgagggag tgttgccatg aaagacaaac cggccaaagg aacgccaacg 3300
cttccccgcca ccagcatgaa cgtgcagaac gccatcctcg gcctgcgcgg tcgtgacctg 3360
atttccacgc tgcgcaatgt cagccgccaa agcctgcgtc acccgctgca caccgcacat 3420
cacctgttgg ccctgggtgg ccagctgggc cgggtgatac tgggtgacac accgcttcag 3480
ccgaacccgc gcgatccgcg cttcagcgac ccgacatgga gccagaaccc gttctaccgg 3540
cgcggcctgc aagcctacct ggcctggcag aagcagaccc gcctgtggat cgaggaaagc 3600
cacctggacg acgatgaccg ggcccgtgcg cacttcctgt tcaacctgat caacgatgcc 3660
ctggcgccaa gcaactcgct gctcaacccg ctggcggtca aggaactgtt caacagcggt 3720
ggccagagcc tggtgcgcgg cgtggcccac ctgctcgatg acctgcgcca caatgacggc 3780
ctgccacgcc aggtcgacga gcgcgccttc gaagtgggcg gcaacctggc cgcgactgcc 3840
ggcgccgtgg tgtttcgcaa cgagctgctg gaactgatcc agtacaagcc gatgagcgaa 3900
aagcagcacg cccggccact gctggtggtg ccgccacaga tcaacaagtt ctacatcttc 3960
gacctcagct cgaccaacag cttcgtccag tacatgctca agaatggcct gcaggtgttc 4020
atggtcagct ggcgcaaccc cgaccgcgcc caccgcgaat ggggcctgtc cagctacgtg 4080
caggccctgg aagaagcgct caacgcttgc cgcagcatta gcggcaaccg cgaccccaac 4140
ctgatgggcg cctgcgccgg cggcctgacc atggccgcac tgcagggcca cctgcaggcc 4200
aagcaccagc tgcgccgggt gcgcagcgcc acctacctgg tcagcttgct ggacagcaag 4260
```

```
ttcgaaagcc ccgccagcct gttcgccgac gagcagacca tcgaggccgc caagcgccgc 4320
tcctaccagc gcggtgtgct ggatggcgcc gaggtggcgc ggatcttcgc ctggatgcgg 4380
cccaacgacc tgatctggaa ctactgggtc aacaactacc tgctcggcaa gacaccacca 4440
gccttcgaca tcctgtactg gaacgccgac agcacgcgcc tgccccgccgc gctgcatggc 4500
gacctgctgg acttcttcaa gctcaacccg ctgacccacc cagccggcct ggaggtatgc 4560
ggcacaccca tcgacctgca gaaggtcgag ctggacagtt tcaccgtggc cggcagcaac 4620
gaccacatca ccccgtggga tgcggtgtac cgctcggcct tgctgctggg tggcgaccgg 4680
cgcttcgtgc tggccaacag cgggcacatc cagagcatca tcaacccgcc cggcaacccc 4740
aaggcctact acctggccaa ccccaagctg tccagcgacc cgcgtgcctg gctccacgat 4800
gccaagcgca gcgaaggcag ctggtggccg ttgtggctgg agtggatcac cgcgcgctcc 4860
ggcccgctca aggcaccgcg cagcgaactg ggcaatgcca cctacccacc gctgggcccc 4920
gcgccgggca cctacgtgct gacccgatga gcatgccgac tggatgaaga ctcgcgaccg 4980
tatcctcgaa tgtgccctgc agctgttcaa ccagcagggc gaaccgaacg tatccaccct 5040
ggaaattgcc aacgaactgg gcatcagccc tggcaacctc tactaccact tccacggcaa 5100
ggagccgttg gtgctggggt tgttcgagcg ctttgaagaa gcgctgatgc ccttgctcga 5160
ccgcccgctg gaggtacgcc tggacgccga ggattactgg ctgttcctgc acctgatcgt 5220
cgaacgcatg gcgcagtacc gcttcctgtt ccaggacctg tcgaacctga ccgggcgcct 5280
gcccaaactg gcccgcggca tgcgcaacct gatcaacgcg ctcaagcgca cactggcggc 5340
gttgctggcc agcctcaagg gccaagggtt ggtagagagc gagacccagg cgctggggca 5400
actggtggag cagatcaccc tgacactgat gttctcgctg gattatcagc gggtactggg 5460
gcgcgagggg gatgtgggga ttgtggtgta ccaggtgatg atgctggtgg cgccgcatct 5520
gcaggcccag gcgcgggggg cggcggagca attggcggtg cggtatctgg aggggtaagc 5580
ctgttgattc ggtgtcggcg ctttgcgggg catgccccgt ccccaggtg aaatgcagtg 5640
ctcgagtgca cacaggacct gtgggagcgg gcaagccccc gaagatggcg acgcggtatc 5700
agatcagggt accggtgcct gtctgtgccg aaggcgggtt gctggccgga gccgcagtgg 5760
gcgccgaagc tgcgctagcg gccggagcgg cgctggccgc tggagctgcc ggcttggcgg 5820
ctgccggctt ggccggtgct ttcttcactg caggcttctt cgccacagcc ggtttggccg 5880
ctgccggttt gccgcaggct tggccgccgc agtcttggca gcaggtttag ccgctgcggc 5940
cttggctgcc ggcttggctg ccgcggtttt gccgcaggct tggccgctgc cgtcttggcc 6000
agtggcttgg ccgccgcctt gctcgcagcc ggtttggctg cagtgcgcga cgaaatcggg 6060
gtaaccgaag cgccggtgag tttctcgatc tgcttggtca ggctgtccac ctgctggtgc 6120
agggccttga tctcgttgcg gctcggcacg ccaaggcgcg agatggcact gttcaggcgc 6180
ttgtcgaagg cctcttcgag ttcgctccac ttgcctagcg cacggtcctt cacgccgcac 6240
acacgcgaag tggtcgacga cttggcagtt tcagcaacat cttctgcggt cttcttcgcc 6300
tgtttctcgg ccttctcgcc atcctttacc agcgagtcga acagcttcgg gccgtcctgg 6360
tcgatcttcg aatagatacc aagccccgcc agccagatct tgcgggagta cttctcgatc 6420
ccgccgccca ggagctgccc tctttctcgg aattc                           6455


<210> 9
<211> 5054
<212> DNA
<213> Pseudomonas putida

<400> 9
ctgcagtcga cctcgccttg ccagtgggcg gcgagcatca ggccctcttc atcgggcagg 60
atgaaaacct gcaaggccgg ctggcggcag tcgatctcga tgaccttgcc ctccagcgcg 120
gccagccgcg gcagggccgt gctgtccatg cgcaggacgc ggttcaggcc atgttcggcg 180
ctggcgagca gccccggccag cagcatccagg gcttgatccc ccgatgcacg gcaacgatgc 240
cgctggtcat gttgtggtag gtgacccggt cgaaaccggc ctcgaccatc atggccttca 300
gggtttcctg atcggggtgc atgcggatcg actcggcgag gtaacggtag ctctccgaat 360
cgttggtgat cagcttgccg gccagcggca tgaaggcgaa cgagtaggcg tcgtaggcct 420
tggacatcag cttgttggtc ggcttggaga actccagcac cagcaggcga ccgcctggct 480
tgagcacgcg cagcatcgag cggatggctt cgtccttgtg ggtgacgttg cgcaggccga 540
aggcgatggt cacgcagtcg aagtggttgt ccgggaatgg cagcttctcg gcgtcggcct 600
gaacgaactc gatgttgccg gccacgccac ggtcgagcag gcggtcacga ccgaccttga 660
gcatcgattc gttgatgtcg gccagcacta cctgaccggt cgggccgacc agccgcgaga 720
acttggcggc caggtcgccg gtaccgccgg cgatgtccag tacacgattg ccggcgcgta 780
cgcccgacag ctcgatggtg aagcgcttcc acaggcggtg catgccgccg gaaagcacat 840
cgttcatcag gtcgtacttg gccgctaccg agtggaacac ctcggcgact ttcttcgcct 900
```

```
tctggctttc agggacgtcc tggtaaccga aatgggtggt gggttcggcg tggtcgcctt 960
tgcgctggtc gttcatatcg cttcaccgga aaaaattacc gccatttcag ggcgaacggg 1020
cagatttgtc ttggcggggt gtgccagtgg gcagggggcgg gcataatgcc cattatgtct 1080
tcatcttcag gaacacccgc atgacccaga tcagcgtcga acgcaaacat tccctcggcc 1140
gcgatgccgc ccgtgccaag gctgaagcgc tggtcgacaa actgacccgc gaatacgacc 1200
tcaaggccac ctggaacggc gacagggtcg acgtggcgcg cagcggtgcc aacggcagcg 1260
tgcacatctt cgatgacccgc atccgcgtcg aattgaagct gggcatgatg ctgtcgatga 1320
tgagcggcac catcaagggc gagatcgagc gggcgctgga caaagccctg gcctgacccc 1380
ttccgggggc catgctcgtt caccttaggg tgaagattct aatttccctc tctaccttgt 1440
gctcaagccc aacctccatg ggcggtttat cctccactca tgagcatgag gtacagagca 1500
tggccaaagt gactgtgaag aaaaaggacg acgccccggg cacgctgggc gaggtgccgc 1560
gctacgcgcg caagatctgg ctggcgggca tcggcgccta tgcgcgtgtg ggccaggaag 1620
gctccgacta cttcaatgag ctggtcaagg ccggcgaagg cgtcgagaag cgtggcaaga 1680
agcgcatcga caaggagctc gatgctgcca acaatcagat cgaagaagcg acccaggaag 1740
tcagtcgcgt acgcggcaag gtcgaagttc aactggacaa gatcgaaaaa gctttcgacg 1800
cgcgggtagg tcgcgccttg aatcgccttg gcattccgtc taaacatgac gttgaggcgt 1860
tgtccatcaa gcttgaacag ctgcacgagc tgctcgagcg cgtcgcgcac aaaccataag 1920
gagagcagga tggctggcaa gaagaattcc gagaaagaag gcagctcctg ggtcggcggg 1980
atcgagaagt actcccgcaa gatctggctg gcgggggcttg gtatctattc gaagatcgac 2040
caggacggcc cgaagctgtt cgactcgctg gtgaaggatg gcgagaaggc cgagaagcag 2100
gcgaagaaga ccgccgaaga tgttgctgaa actgccaagt cgtcgaccac ttcgcgtgtg 2160
tcgggcgtga aggaccgtgc gctggcaaag tggagcgaac tcgaagaggc cttcgacaag 2220
cgcctgaaca gcgccatctc gcgccttggc gtgccgagcc gcaacgagat caaggccctg 2280
caccagcagg tggacagcct gaccaagcag atcgagaaac ttaccggcgc ttcgcttacc 2340
ccgatttcgt cgcgcgctgc ggccaaaccg gctgcgagca aggcggcggc caagccactg 2400
gccaagacgg cagcggccaa gcctgcggcg aaaactgcgg cggccaagcc ggcggccaag 2460
actgctgcgg cgaaacctgc tgccaagact gcagcggcca agcctgcggc gaaaccggca 2520
gcggccaagc cggctgtggc gaagaagccg gcagtgaaga aagcaccggc caagccagca 2580
gccgccaagc cggcagctcc agcggcgagc gccgctccga ccgctagcgc agctcctgca 2640
ccaaccgcgg ctccggccag caatcgcgct tcggcaccga caggcaccgg taccctgatc 2700
tgataccgcg tcgccttctt cgcgggcttg cccgctccca caggtactgt gtgcactcga 2760
gcactgcatt tcacctgtgg gagcgggcat gcccgcgaaa gccgcgacac cgaaacaaca 2820
ggcttacccc tccagatacc tcaccgccaa ctgctccgcc gccccccgcg cctgggcctg 2880
cagatgcggc gccaccagca tcatcacctg gtacaccaca atccccacat ccccctcgcg 2940
ccccagtacc cgctggtaat ccagcgagaa catcagtgtc agggtgatct gctccaccag 3000
ttgccccagc gcctgggtct cgctctctac cagccccctgg cccttgaggc tggccagcaa 3060
cgccgccagt gtgcgcttga gtgcgttgat caggctgcgc atgccgcggg ccagtttggg 3120
caggcgcccg gtcaggttcg acaggtcctg gaacaggaag cggtactgcg ccatgcgttc 3180
gacgatcagg tgcaggaaca gccagtaatc ctcggcatcc aggcgtacct ccagtggcgg 3240
gtcgagcaag ggcattagcg cttcttcaaa gcgctcgaac agccccagca ccaacggctc 3300
cttgccgtgg aagtggtagt agaggttgcc ggggctgatg cccagttcgt tggcaatttc 3360
cagggtggat acgttcggtt cgcctgctg gttgaacagc tgcagggcac attccaggat 3420
acggtcgcga gtcttcatcc agtcggcatg ctcatcgggt cagcacgtag gtgccccgcg 3480
cagggcccag cggtgggtag gtggcattgc ccagttcgct gcgtggtgcc ttgagcgggc 3540
cggagcgtgg tgtgatccac tccagccaca acggccacca gcrgccttcg ctgcgcttgg 3600
cgtcgtggaa ccaggcacgg gggtcgctgg acagcttggg gttggccagg taataggcct 3660
tggggttgcc gggcgggttg atgatgctct ggatgtgccc gctgttggcc agcacgaagc 3720
gacggtcgcc gcccagcagc aaggccgagc ggtacaccgc atcccacggg gtgatgtggt 3780
cgttgctgcc ggccacggtg aaactgtcca gatcgacctt ctgcaggtcg atgggggtgc 3840
cgcatacctc caggccggct gggtgagtca gcgggttgag cttgaagaag tccagcaggt 3900
cgccatgcag cgcggcgggc aggcgcgtgc tgtcggcgtt ccagtacagg atgtcgaaag 3960
ctggtggtgt cttgccgagc aggtagttgt tgacccagta gttccagatc aggtcgttgg 4020
gccgcatcca ggcgaagatc cgcgccacct cggcgccatc cagcacgcct cgttggtagg 4080
agcggcgctt ggcggcttcg atggtctgct cgtcggcgaa caggctggcg gggctttcga 4140
acttgctgtc cagaaggctg accaggtagg tggcgctgcg caccccgacgc agctggtgct 4200
tggcctgcag gtgaccctgt agcgcggcca tggtccggcc gccggcgcag gccccccatca 4260
ggttgggctc gcggttgccg ctgatgctgc ggcaagcgtt gagcgcttct tccagggcct 4320
gcacgtagct cgacaggccc cattcgcggt ggcgcgggtc ggggttgcgc cagctcacca 4380
tgaacacctg caggccattc ttgagcatgt actggacgaa gctgttgggc gagctgaggt 4440
cgaagatgta gaacttgttg atctgtggcg gcactaccag cagtggccgg gcgtgctgct 4500
```

tttcgctcat cggcttgtac tggatcagct ccagcagctc gttgcgaaac accacggcgc 4560
cggcggttgc agccaggttg ccgcccactt cgaaggcgcg ctcgtcgacc tggcgtggta 4620
ggccatcgtt gtggcgcagg tcatcgagca ggtgggccac gccgcgtacc aggctctggc 4680
caccgctgtt gaacagttcc ttgaccgcca gcgggttgag cagcgagttg ctcggcgcca 4740
gtgcatcgtt gatcaggttg aacaggaagt gcgcacgggc ccggtcatcg tcgtccaggt 4800
ggctttcctc gatccacagg cgggtctgct tctgccaggc caggtaggct tgcaggccgc 4860
gccggtagaa cgggttctgg ctccatgtcg ggtcgctgaa gcgcggatcg cgcgggttcg 4920
gctgaaacgg tgtgtcaccc agcatcaccc tgcccagctg accacccagg gccaacaggt 4980
gatgcgcggt gtgcagcggg tgacgcaggc tttggcggct gacattgcgc agcgtggaaa 5040
tcaggtcacg gccg 5054

<210> 10
<211> 7311
<212> DNA
<213> Pseudomonas aeruginosa

<400> 10
ctgcagggcc gcctgccgat ccgcgtggag ctcaaggccc tcagtccgaa cgatttcgag 60
cgcatcctca ccgagccgca tgcctcgctc accgagcagt accgcgagct gctgaagacc 120
gaggggctgg ccatcgagtt cgccgaggac ggcatcaagc gccttgccga gatcgcctgg 180
caggtcaacg agaagaccga gaacatcggt gcccgccgcc tgcatacgct gctcgagcgg 240
ctgctggaag aggtctcgtt cagcgccgcc gacctggcca gcgagcatag cgacaagccg 300
atcctgatcg atgccggcta cgtcaacagc cacctcggcg agctggccga ggacgaggac 360
ctgtcccgct acatcctttg accaccgccg ccgccacggc caacaccgtg gcggcggcgc 420
gcgcggtccc gaaccggggt atccttgtac tccgccgttc cgcgagtccg atgcgatgcg 480
tatcccttcc gccatccagc tgcacaaagc ctcgaagacc ctgaccctgc gctacggcga 540
ggatagctac gacctgcctg ccgagttcct ccgcgtgcat tcgccctcgg ccgaggtcca 600
gggccacggc aacccggtat tgcagtacgg caagctgaac gtcggcctgg tcggcgtcga 660
accgccggcc cagtacgcac tgaagctgag cttcgacgac ggccacgaca gcggcctgtt 720
cacctgggac tacctgtacg agctggcgac ccgcaaggac cagctatggg ccgactacct 780
ggcggagctg gccagccgcg gcaagtcgcg cgacccccgc gagtcggtcg tcaagctgat 840
gctctgaagc gccgggccga gtgcccgttc gcggcacacg gcatccaggc gatttttctc 900
cgctgccccg aacgagggca cgtcatttgc aacattcgcc ccgcagactg ccagaccaga 960
catccggtcg gcgcggtcgc cacggcgaat gtcctacgct gcacggcagc aacgctctag 1020
tccgcaggtc ggccgctcgc cgggccagcc acgccggcca ccgatgcttc tgccagcttg 1080
cacgccagcg gaaactcgcg taaccaagac ggtgcagccc cttgtccggg ttcccttccc 1140
tgacgtgcgt ccgccccgcc ctgaaacgtg cgggtgggct ggtagtcgag cagtagccgg 1200
ccggacacct agtccccggt ttcgttgcgg tcccctgttt cgcctcgaac aatggagcgt 1260
tgccgatgag tcagaagaac aataacgagc ttcccaagca agccgcggaa aacacgctga 1320
acctgaatcc ggtgatcggc atccggggca aggacctgct cacctccgcg cgcatggtcc 1380
tgctccaggc ggtgcgccag ccgctgcaca gcgccaggca cgtggcgcat ttcagcctgg 1440
agctgaagaa cgtcctgctc ggccagtcgg agctacgccc aggcgatgac gaccgacgct 1500
tttccgatcc ggcctggagc cagaatccac tgtacaagcg ctacatgcag acctacctgg 1560
cctggcgcaa ggagctgcac agctggatca gccacagcga cctgtcgccg caggacatca 1620
gtcgtggcca gttcgtcatc aacctgctga ccgaggcgat gtcgccgacc aacagcctga 1680
gcaacccggc ggcggtcaag cgcttcttcg agaccggcgg caagagcctg ctggacggcc 1740
tcggccacct ggccaaggac ctggtgaaca acggcgggat gccgagccag gtggacatgg 1800
acgccttcga ggtgggcaag aacctggcca ccaccgaggg cgccgtggtg ttccgcaacg 1860
acgtgctgga actgatccag taccggccga tcaccgagtc ggtgcacgaa cgcccgctgc 1920
tggtggtgcc gccgcagatc aacaagttct acgtcttcga cctgtcgccg gacaagagcc 1980
tggcgcgctt ctgcctgcgc aacggcgtgc agacgttcat cgtcagttgg cgcaacccga 2040
ccaagtcgca gcgcgaatgg ggcctgacca cctatatcga ggcgctcaag gaggccatcg 2100
aggtagtcct gtcgatcacc ggcagcaagg acctcaacct cctcggcgcc tgctccggcg 2160
ggatcaccac cgcgaccctg gtcggccact acgtggccag cggcgagaag aaggtcaacg 2220
ccttcacccа actggtcagc gtgctcgact tcgaactgaa tacccaggtc gcgctgttcg 2280
ccgacgagaa gactctggag gccgccaagc gtcgttccta ccagtccggc gtgctggagg 2340
gcaaggacat ggccaaggtg ttcgcctgga tgcgcccgaa cgacctgatc tggaactact 2400
gggtcaacaa ctacctgctc ggcaaccagc cgccggcgtt cgacatcctc tactggaaca 2460
acgacaccac gcgcctgccc gccgcgctgc acggcgagtt cgtcgaactg ttcaagagca 2520

```
acccgctgaa ccgccccggc gccctggagg tctccggcac gcccatcgac ctgaagcagg 2580
tgacttgcga cttctactgt gtcgccggtc tgaacgacca catcacccca tgggagtcgt 2640
gctacaagtc ggccaggctg ctgggtggca agtgcgagtt catcctctcc aacagcggtc 2700
acatccagag catcctcaac ccaccgggca accccaaggc acgcttcatg accaatccgg 2760
aactgcccgc cgagcccaag gcctggctgg aacaggccgg caagcacgcc gactcgtggt 2820
ggttgcactg gcagcaatgg ctggccgaac gctccggcaa gaccccgcaag gcgcccgcca 2880
gcctgggcaa caagacctat ccggccggcg aagccgccgc cggaacctac gtgcatgaac 2940
gatgaaaagc gaccagcctg aagaacagcc gcaggagcga tccgcggcct ccgccgacga 3000
aaccccgcca gcgcctccgg cgcggccccg tgccgcgcgg aagccggcca ggccccgtat 3060
cgccgagccc gcggctgcgc cgccgaggac cccgagcatg ccccagccct tcgtcttccg 3120
gaccatcgac ctcgacggcc agaccatccg caccgcagtg cggccgggca aggaaggaag 3180
cactccgctg ctgatcttca acggcatagg cgccaacctg gaactggtgt tccccttcgt 3240
ccaggcgctc gacccggaac tggaggtgat cgccttcgac gttccccggcg tcggcggttc 3300
ctcgacgccc agcgtgccct accgctttcc cggcctggcc aagctggcgg cgcggatgct 3360
cgactacctg gactacggcc aggtcaacgc gatcggcgtg tcctgggggcg gcgcgctggc 3420
ccagcagttc gcccacgact atccggaacg ctgcaagaag ctgatcctcg ccgccacttc 3480
ggctggcgcg gtgatggtgc cgggcaagcc gaaggtactg atgcgcatgg ccagcccgcg 3540
gcgctacatc cagccctcct atggcgtaca catcgccccg gacatctacg gcgggctctt 3600
ccgccgcgac cccaagctgg ccatggcgca tgccagcaag gtgcgttcgt cgggcaagct 3660
gggctactac tggcaactgt tcgccgggct cggctggacc agcatccact ggctgcatag 3720
gatccgccag ccgaccctgg tgctggccgg cgacgacgac ccgatcatcc cgctgatcaa 3780
catgcgtgtg ctggcctggc gcatccccaa cgccgaactg cacgtgatcg acgacggcca 3840
cctgttcctg gtgaccccgc ccgaatcggt ggcgccgatc atcatgaagt tcctcgccga 3900
ggagcgccgt cgcgccgtca tgcaccctcg tccgttcctg ccccaagaccg gctgaactgc 3960
tgcacgggca acaccagggc agcagacact gcttcgtcat ggtgcaggtg catagtcaat 4020
gttccgcaac ggcgcatggc gcctggcttc gccgcgacag cgcaagctct gcgacgcccc 4080
tcccggcgtt gtggtacagc gcttgctgcc ccactgtcgg gcggcaacct cctgttcag 4140
gcaggtgtgc ggttctgccc cgggtgaaac ggaattcaca ggctataact gagtattccg 4200
agccagggga cgatcgcccg tggcatccag actgtggtcc tacgacggag tgtggtccat 4260
gcgagaaaag caggaatcgg gtagcgtgcc ggtgcccgcc gagttcatga gtgcacagag 4320
cgccatcgtc ggcctgcgcg gcaaggacct gctgacgacg gtccgcagcc tggctgtcca 4380
cggcctgcgc cagccgctgc acagtgcgcg gcacctggtc gccttcggag gccagttggg 4440
caaggtgctg ctgggcgaca ccctgcacca gccgaacccc caggacgccc gcttccagga 4500
tccatcctgg cgcctcaatc ccttctaccg gcgcaccctg caggcctacc tggcgtggca 4560
gaaacaactg ctcgcctgga tcgacgaaag caacctggac tgcgacgatc gcgcccgcgc 4620
ccgcttcctc gtcgccttgc tctccgacgc cgtggccacc agcaacagcc tgatcaatcc 4680
actggcgtta aaggaactgt tcaataccgg cgggatcagc ctgctcaatg gcgtccgcca 4740
cctgctcgaa gacctggtgc acaacggcgg catgcccagc caggtgaaca agaccgcctt 4800
cgagatcggt cgcaacctcg ccaccacgca aggcgcggtg gtgttccgca acgaggtgct 4860
ggagctgatc cagtacaagc cgctgggcga gcgccagtac gccaagcccc tgctgatcgt 4920
gccgccgcag atcaacaagt actacatctt cgacctgtcg ccggaaaaga gcttcgtcca 4980
gtacgccctg aagaacaacc tgcaggtctt cgtcatcagt tggcgcaacc ccgacgccca 5040
gcaccgcgaa tggggcctga gcacctatgt cgaggccctc gaccaggcca tcgaggtcag 5100
ccgcgagatc accggcagcc gcagcgtgaa cctggccggc gcctgcgccg gcgggctcac 5160
cgtagccgcc ttgctcggcc acctgcaggt gcgccggcaa ctgcgcaagg tcagtagcgt 5220
cacctacctg gtcagcctgc tcgacagcca gatggaaagc ccggcgatgc tcttcgccga 5280
cgagcagacc ctggagagca gcaagcgccg ctcctaccag catggcgtgc tggacgggcg 5340
cgacatggcc aaggtgttcg cctggatgcg ccccaacgac ctgatctgga actactgggt 5400
caacaactac ctgctcggca ggcagccgcc ggcgttcgac atcctctact ggaacaacga 5460
caacacgcgg ctgcccgcgg cgttccacgg cgaactgctc gacctgttca agcacaaccc 5520
gctgacccgc ccgggcgcgc tggaggtcag cgggaccgcg gtggacctgg gcaaggtggc 5580
gatcgacagc ttccacgtcg ccggcatcac cgaccacatc acgccctggg acgcggtgta 5640
tcgctcggcc ctcctgctgg gcggccagcg ccgcttcatc ctgtccaaca gcgggcacat 5700
ccagagcatc ctcaaccctc ccggaaaccc caaggcctgc tacttcgaga acgacaagct 5760
gagcagcgat ccacgcgcct ggtactacga cgccaagcgc gaagagggca gctggtggcc 5820
ggtctggctg ggctggctgc aggagcgctc gggcgagctg ggcaaccctg acttcaacct 5880
tggcagcgcc gcgcatccgc ccctcgaagc ggccccgggc acctacgtgc atatacgctg 5940
aaagatccgg cccgggcgcc tggagccggg cacctccatc cccagaagaa gtccggatga 6000
agacacgcga ccgaatcctc gaatgctcgc tgttgctgtt caacgaacag ggcgagccca 6060
acgtctcgac actggagatc gccaacgaac tgggcatcag ccccgggcaat ctctactacc 6120
```

acttccatgg caaggaaccg ctggtgatgg cgctgttcga gcggttccag gccgagttgg 6180
cgccgctgct cgatccgccc gaggaggtgc gcctgggcgc ggaggactac tggctgttcc 6240
tgcacctgat cgtcgagcgc ctcgcccact accgcttcct gttccaggac ctgtccaacc 6300
tgaccgggcg cctgccacgg ctggctcgcg gcatccgtac ctggctcggc gcgctgaagc 6360
ggacgctggc caccctgctg gcccgcctca aggccgaccg gcagttgcgc agcgacgcgc 6420
cggcactcgg gcaactggtc gaagagatca ccctgaccct gctgttctcc ctggattacc 6480
agcgggtact gggcaqcaag ggcgaggtgc gcacggtggt ctaccagatc atgatgctgg 6540
tcgccccgca tctgcgcagc gaggcccaac gctcggcgga aagcctggcg cagcgctacc 6600
tgggaccgga atgaaaaacg ccgqgcgaqt gccgggcgtg tgccttgccg ccaggactca 6660
gccctggctg ctcggcgtcg ccggagcgtt cgctgccgga gcgctggcag ccggtgtggc 6720
ggcgggggca gcgggcgcgc tcgaagacgc ggcgggagcg gccggtttcg ccgcggcggg 6780
cttggctgcc ggcttcttcg ccgcaggctt tttgccagcc ggcttggcgg caggtttcgc 6840
cgcgggcttg gcggcggtcg cagcggccgg cttggctgcc ggcttcgcgg caggcttggc 6900
tgcggcaggt ttcgcagcag gcttcgccgc ggccttggct gccggcttgg tcgccggttt 6960
cgctgcggcc ttcgcagtcg gtttggcggc gggcttggct gccggcttgg cggccgcggt 7020
tttcgccgcg gttttttcg ccgcqggttt cgccgcaggc ttggcggcgg ccttggctgc 7080
cggtttagct gccggcttgg ccgctgcggt tttcgccgcg ggcttggcag ccggtttcgc 7140
cgcaggcttg gccgctgcct tcgccgccgg cttgacgctg acgccggtga gtttctcgat 7200
ctgcttggtc agcgtatcga ccttgctgtg cagctccttc acctcgttgc ggctcggcac 7260
gccgagacgc gagatggcgc tgttcaggcg cttgtcgaaa gcttcctcga g 7311

<210> 11
<211> 5951
<212> DNA
<213> Aeromonas caviae

<400> 11
gatatccatc agcccctgac agagagcact gatatgaccg gcaggcatcg ccatcccctg 60
ccatcccgcc gcgtactggg tgtgattgga aaactgcacc gtattgacgg gccagacctc 120
catgccgaga cggcgcatgg ggaagacggc ggcgctgttg ccggcacagc cgaaaaccac 180
gtgggactgg atagagagaa tgcgtttcat cgacaccacc actgaagaag catgaggaaa 240
gcgggcaata tatcggatgc atagcgggct ctgccagcga ttcccggcaa ccctcgccat 300
ttatgcggca aaaagcccat tcaatggagt gttacaccaa cttcccccca cgcctgctca 360
acctggcaag ccaagagcgc ctcggccccg tcggtgtgat atgggctctt cacactcttg 420
tttgatggca tatgagggca tttttaatac aaggtggcgg atggcgggag aaagcgtcga 480
ggaagagcaa tgaggcgcgg cggcaggcaa gccgggccg acgccccggg ctttgtactt 540
aaggcttaag gcctgacgaa gtgatagacc cagccttcgt ccaggggaa atcggagggc 600
gcagagacaa gtgccggcag ggaggcgacg gcccctccgg cggcgtattg cagcgccatc 660
agggcgcaga gggcggcgtc gtaacgatcc gtcccggcca ccacatcagg tggcaaggag 720
gcggctatct ccgccctggc cggtgaggcc ttgcctgcta ccttggcaaa gagccgggat 780
agacctccag cacggcgcga tcggcgtggg gctgctgcct cgggcacaag ctgcagatcc 840
ccgaggcgcg gcaagatgga gagcgccagg gtggcgttgt tgcctagcct gtcgaaggtg 900
gccgacagcg gcttcttgcc gtattgctgc tgcagccagc gctcgcagtc ccgataggca 960
tagggqttgt ctatctcccg ctgggqcacg gcgcactcga ctcccctccc cgccagcaga 1020
tcgccgaggg ctcggggaaa ggccagqggg gcatcgatgc cgagcgccag tcgcgggcag 1080
gccagcacct gcatcagcgc catctcgtct tgcagcgccg ggcgcagcaa ggcgtccaga 1140
tccggcgcca cccgggagct caaccgaaac aggggggaga ccccgagcca gtgcaactgc 1200
tgcgtgcggg cctgccagcc caccacggcc accgcctggg cattgccctg ccagcccctt 1260
acatcccaac cgatgccgat ggcatccaag tgttccgttg tcatgccccc gtcacctctg 1320
cgcactattg atggagcaca gggtaatggc tgcgccccta aaagcaaggc tggcggcacc 1380
gcttagaaag atttcttgaa gttgatcagc ggcaagatgg ggaagatgcc gttctctgcg 1440
tagttggcga gccctatctg caggccatcg aggtgcttgg tggcattgat gaagccaagc 1500
tggaaggtgg tgcgctcggc atagttgacg aagccgaggt tggccagggc attgcccttg 1560
gcgatgttga ccgcccccca gttcagcccc tgcacgttgt tggtcaggtt gacgaaaccc 1620
aggttgaccc cggtgtcctg ccctcatgc cagttgacgg cgttgatggc gacccccgcg 1680
aactgatggc gcacccgggc ggcgccgaag aagatgccaa gctgcaggcc ggtgaactga 1740
tccacgtcgg agaggggcgaa caccggcaga tctatgccct tcacctgacc ggtgcggcca 1800
tacaggaagg aggcgcgcgc cccttccacc tggtgggagg aaggcaggtt gatgccggcc 1860
agggagatct ggaccggggt gctggcctgg gccacgccgg cgagggccag cgcggagcaa 1920

```
ccgagcagca gggcgagagg tttcatcggg attccttggc agtctgaatg acgtgccagc 1980
ctatcagcgc ggcgccggtg cggcgagggc gcgccggacc cagtgcgtca cctctcgtct 2040
gatccgcctc cctcgacggg cgtcgctgac aaaaaaattc aaacagaaat taacatttat 2100
gtcatttaca ccaaaccgca tttggttgca gaatgctcaa acgtgtgttt gaacagagca 2160
agcaacacgt aaacagggat gacatgcagt acccgtaaga agggccgatt ggcccacaac 2220
aacactgttc tgccgaactg gagaccgatg atgaatatgg acgtgatcaa gagctttacc 2280
gagcagatgc aaggcttcgc cgcccccctc acccgctaca accagctgct ggccagcaac 2340
atcgaacagc tgacccggtt gcagctggcc tccgccaacg cctacgccga actgggcctc 2400
aaccagttgc aggccgtgag caaggtgcag gacacccaga gcctggcggc cctgggcaca 2460
gtgcaactgg agaccgccag ccagctctcc cgccagatgc tggatgacat ccagaagctg 2520
agcgccctcg gccagcagtt caaggaagag ctggatgtcc tgaccgcaga cggcatcaag 2580
aaaagcacgg gcaaggcctg ataacccctg gctgccccgtt cgggcagcca catctccca 2640
tgactcgacg ctacgggcta gttcccgcct cgggtgtggg tgaaggagag cacatgagcc 2700
aaccatctta tggcccgctg ttcgaggccc tggcccacta caatgacaag ctgctggcca 2760
tggccaaggc ccagacagag cgcaccgccc aggcgctgct gcagaccaat ctggacgatc 2820
tgggccaggt gctggagcag ggcagccagc aaccctggca gctgatccag gcccagatga 2880
actggtggca ggatcagctc aagcigatgc agcacaccct gctcaaaagc gcaggccagc 2940
cgagcgagcc ggtgatcacc ccggagcgca gcgatcgccg cttcaaggcc gaggcctgga 3000
gcgaacaacc catctatgac tacctcaagc agtcctacct gctcaccgcc aggcacctgc 3060
tggcctcggt ggatgccctg gagggcgtcc cccagaagag ccgggagcgg crgcgtttct 3120
tcaccccgca gtacgtcaac gccatggccc ccagcaactt cctggccacc aaccccgagc 3180
tgctcaagct gaccctggag tccgaccggc agaacctggt gcgcggactg gccctcttgg 3240
ccgaggatct ggagcgcagc gccgatcagc tcaacatccg cctgaccgac gaatccgcct 3300
tcgagctcgg gcgggatctg gccctgaccc cgggccgggt ggtgcagcgc accgagctct 3360
atgagctcat tcagtacagc ccgactaccg agacggtggg caagacacct gtgctgatag 3420
tgccgccctt catcaacaag tactacatca tggacatgcg gccccagaac tccctggtcg 3480
cctggctggt cgcccagggc cagaccgtat tcatgatctc ctggcgcaac ccgggcgtgg 3540
cccaggccca aatcgatctc gacgactacg tggtggatgg cgtcatcgcc gccctggacg 3600
gcgtggaggc ggccaccggc gagcgggagg tgcacggcat cggctactgc atcggcggca 3660
ccgccctgtc gctcgccatg ggctggctgg cggcgcggcg ccagaagcag cgggtgcgca 3720
ccgccaccct gttcactacc ctgctggact tctcccagcc cggggagctt ggcatcttca 3780
tccacgagcc catcatagcg gcgctcgagg cgcaaaatga ggccaagggc atcatggacg 3840
ggcgccagct ggcggtctcc ttcagcctgc tgcgggagaa cagcctctac tggaactact 3900
acatcgacag ctacctcaag ggtcagagcc cggtggcctt cgatctgctg cactggaaca 3960
gcgacagcac caatgtggcg ggcaagaccc acaacagcct gctgcgccgt ctctacctgg 4020
agaaccagct ggtgaagggg gagctcaaga tccgcaacac ccgcatcgat ctcggcaagg 4080
tgaagacccc tgtgctgctg gtgtcggcgg tggacgatca catcgccctc tggcagggca 4140
cctggcaggg catgaagctg tttgcgcggg agcagcgctt cctcctggcg gagtccggcc 4200
acatcgccgg catcatcaac ccgccggccg ccaacaagta cggcttctgg cacaacgggg 4260
ccgaggccga gagcccggag agctggctgg caggggcgac gcaccagggc ggctcctggt 4320
ggcccgagat gatgggcttt atccagaacc gtgacgaagg gtcagagccc gtcccccgcc 4380
gggtcccgga ggaagggctg gccccgccc ccggccacta tgtcaaggtg cggctcaacc 4440
ccgtgtttgc ctgcccaaca gaggaggacg ccgcatgagc gcacaatccc tggaagtagg 4500
ccagaaggcc cgtctcagca agcggttcgg ggcggccggag gtagccgcct tcgccgcgct 4560
ctcggaggac ttcaaccccc tgcacctgga ccccggcttc gccgccacca cggcgttcga 4620
gcggcccata gtccacggca tgctgctcgc cagcctcttc tccgggctgc tgggccagca 4680
gttgccgggc aaggggagca tctatctggg tcaaagcctc agcttcaagc tgccggtctt 4740
tgtcggggac gaggtgacgg ccgaggtgga ggtgaccgcc cttcgcgagg acaagcccat 4800
cgccaccctg accacccgca tcttcaccca aggcggcgcc ctcgccgtga cgggggaagc 4860
cgtggtcaag ctgccttaag caccggcggc acgcaggcac aatcagcccg gcccctgccg 4920
ggctgattgt tctccccccc tccgcttgcc ccctttttcg gggcaatttg gcccaggccc 4980
tttcctgcc ccgcctaact gcctaaaatg gccgccctgc cgtgtaggca ttcatccagc 5040
tagaggaatt c                                                      5051
```

<210> 12
<211> 2849
<212> DNA
<213> Thiococcus pfennigii

<400> 12
ggatcctggt cgcgagcgcg ccgcccagcc acctgccggc gcgccccgcc gggaccgctc 60
gaggacgcct cgcgaaggct ctaggggctg tatcttcaag agtctacgcc cctttgttgc 120
agtgcacaaa tttccgtgct agcttcatgc tatcacgccc cagacgagga agattcaccg 180
tgaacgatac ggccaacaag accagcgact ggctggacat ccaacgcaag tactgggaga 240
cctggtcgga gctcggccgc aagaccttgg gtctggagaa gaccccggcc aatccttggg 300
ccggcgccct cgatcattgg tggcagacgg tctcgccccc cgccccccaac gacctggttc 360
gcgacttcat ggagaagctc gccgagcagg gcaaggcctt cttcggcctc accgactact 420
tcacgaaggg cctcggcggc agtagcggta cgcagggctg ggacacccta tcgaagacca 480
tcgacgacat gcaaaaggcc ttcgccagcg gccggatcga aggcgacgag accttccgcc 540
gcctgatggc cttctgggag atgccgctcg acaactggca gcgcaccatg tactcgctgt 600
ccccggtgcc cggcgacctg ctgcgcaaca tgccgcacga ccaagtcagg gacagcgtcg 660
accgcatcct ctcggcaccc gggctcggct acacgcgcga ggagcaggcc cgctaccagg 720
atctgatccg ccgctcgctg gagtaccagt cggcctgaa cgaatacaac ggcttcttcg 780
gccagctcgg tgtcaagtcc ctcgagcgga tgcgcgcctt cctgcaggga caggccgaga 840
aggycgtcgc catcgagtcg gcgcgcaccc tctacgacgc ctgggtcggc tgctgcgaag 900
aggtctatgc cgaggaggtc agctccgccg actacgcgca catccacggc cgcctcgtca 960
acgcccagat ggccctcaag cagcgcatgt cgaccatggt cgacgaggtc ctcggcgcga 1020
tgccgctgcc gacccgcagc gagctgcgca cgctccagga tcggctccag gagtcgcgcg 1080
gcgagggcaa gcgccagcgc caagagatcg agacgctgaa gcggcaggtc gcggccttgg 1140
ccggcggcgc ccagcccgcg ccccaggcct ccgcccagcc cagcacccgg ccccgccggg 1200
cgacggcccc ggcggcgagc gcggcgcccc agcgcagcac cacgacccgc cgcaagacca 1260
ccaagcccac cacccggccag tgatgtcggc cgcccgtcca tcgccaccag gagaggtgc 1320
cgtgtccccc ttcccgatcg acatccggcc cgacaagctg accgaggaga tgctggagta 1380
cagccgcaag ctcggcgagg gtatgcagaa cctgctcaag gccgaccaga tcgacacagg 1440
cgtcaccccc aaggacgtcg tccaccgcga ggacaagctg gtcctctacc gctaccggcg 1500
cccggcgcag gtggcgaccc agacgatccc gctgctgatc gtctacgccc tcgtcaatcg 1560
gccctacatg accgacatcc aggaggatcg ctcgacgatc aagggcctgc tcgccaccgg 1620
tcaggacgtc tatctgatcg actggggcta cccggatcag gccgaccggg cgctgaccct 1680
cgatgactac atcaacggct acatcgaccg ctgcgtcgcc tacctgcgcg agaccccacgg 1740
cgtcgaccag gtcaacctgc tcgggatctg ccagggcggg gccttcagcc tctgctacac 1800
ggccctgcac tccgagaagg tcaaaaacct cgtcaccatg gtcacgccgg tcgacttcca 1860
gaccccgggc aacctgctct cggcctgggt ccagaacgtc gacgtcgacc tggccgtcga 1920
caccatgggc aacatcccgg gcgaactgct caactggacc ttcctgtcgc tcaagccctt 1980
cagcctgacc ggccagaagt acgtcaacat ggtcgacctg ctcgacgacg aggacaaggt 2040
caagaacttc ctgcggatgg agaagtggat cttcgacagc ccggaccagg ccggcgagac 2100
cttccgccag ttcatcaagg acttctacca gcgcaacggc ttcatcaacg gcggcgtcct 2160
gatcggcgat caggaggtcg acctgcgcaa catccgctgc cgggtcctga acatctaccc 2220
gatgcaggac cacctggtgc cgccggatgc ctccaaggcc ctcgcgggac tgacctccag 2280
cgaggactac acggagctcg ccttcccggg cgggcacatc ggcatctacg tcagcggcaa 2340
ggcgcaggaa ggagtcaccc cggcgatcgg ccgctggctg aacgaacgcg gctgagccgg 2400
gtcgacccac ccgctcgacg ggcgcggccg gcggcatcga aggccgccgg ccggcgccca 2460
tgagccatcc gcgccgctgg cgccccgccc ccgaccttcg ccgccgcacc cgcatcgccc 2520
ccgcggctgg cgtacaatga cggtcttcgc gagcgagccc cgcatcgtca acggaggctg 2580
catgggcgcc gaccaccaac tgctggccgc gtacgacgcg ctggccgaga cctacgacgc 2640
ccaccgcggc ctcttcgaca tgcgcgccgt gctcgaggac atcttcgccc gcctgccggc 2700
ctgcggcacc ctcctcgacc tcggctgcgg cgccgggggag ccgtgcgcgc gcgccttcct 2760
cgaccgcggc tggcgggtga ccgggctgga cttctgcccg gccatgctcg ccctcgcggc 2820
gcgctacgtc cccgagatgg agcggatcc 2849

<210> 13
<211> 2768
<212> DNA
<213> Ralstonia eutropha

<400> 13
cccgggcaag taccttgccg acatctatgc gctggcgcgc acgcgcctgg cgcgcgccgg 60
ctgtaccgag gtctacggcg gcgacgcctg caccgtggcc gacgccggtc gcttctactc 120
ctatcggcgc gatggcgtga ccggccgcat ggccagcctg gtctggctgg cggactgagc 180

ccgccgctgc ctcactcgtc cttgcccctg gccgcctgcg cgcgctcggc ttcagccttg 240
cgtcggcggc ggccgggcgt gcccatgatg tagagccacca cgccaccggc gccatgccat 300
acatcaggaa ggtggcaacg cctgccacca cgttgtgctc ggtgatcgcc atcatcagcg 360
ccacgtagag ccagccaatg gccacgatgt acatcaaaaa ttcatccttc tcgcctatgc 420
tctgggggcct cggcagatgc gagcgctgca taccgtccgg taggtcgggа agcgtgcagt 480
gccgaggcgg attcccgcat tgacagcgcg tgcgttgcaa ggcaacaatg gaatcaaatg 540
tctcggaatc gctgacgatt cccaggtttc tccggcaagc atagcgcatg gcgtctccat 600
gcgagaatgt cgcgcttgcc ggataaaagg ggagccgcta tcggaatgga cgcaagccac 660
ggccgcagca ggtgccgtcg aggcttcca gccagttcca gggcagatgt gccggcagac 720
cctcccgctt tgggggaggc gcaagccggg tccattcgga tagcatctcc ccatgcaaag 780
tgccggccag ggcaatgccc ggagccggtt cgaatagtga cggcagagag acaatcaaat 840
catggcgacc ggcaaaggcg cggcagcttc cacgcaggaa ggcaagtccc aaccattcaa 900
ggtcacgccg gggccattcg atccagccac atggctggaa tggtcccgcc agtggcaggg 960
cactgaaggc aacggccacg cggccgcgtc cggcattccg ggcctggatg cgctggcagg 1020
cgtcaagatc gcgccgccgc agctgggtga tatccagcag cgctacatga aggacttctc 1080
agcgctgtgg caggccatgg ccgagggcaa ggccgaggcc accggtccgc tgcacgaccg 1140
gcgcttcgcc ggcgacgcat ggcgcaccaa cctccatat cgcttcgctg ccgcgttcta 1200
cctgctcaat gcgcgcgcct tgaccgagct ggccgatgcc gtcgaggccg atgccaagac 1260
ccgccagcgc atccgcttcg cgatctcgca atgggtcgat gcgatgtcgc ccgccaactt 1320
cattgccacc aatcccgagg cgcagcgcct gctgatcgag tcgggcggcg aatcgctgcg 1380
tgccggcgtg cgcaacatga tggaagacct gacacgcggc aagatctcgc agaccgacga 1440
gagcgcgttt gaggtcggcc gcaatgtcgc ggtgaccgaa ggcgccgtgg tcttcgagaa 1500
cgagtacttc cagctgttgc agtacaagcc gctgaccgac aaggtgcacg cgcgcccgct 1560
gctgatggtg ccgccgtgca tcaacaagta ctacatcctg gacctgcagc cggagagctc 1620
gctggtgcgc catgtggtgg agcagggaca tacggtgttt ctggtgtcgt ggcgcaatcc 1680
ggacgccagc atggccggca gcacctggga cgactacatc gagcacgcgg ccatccgcgc 1740
catcgaagtc gcgcgcgaca tcagcggcca ggacaagatc aacgtgctcg gcttctgcgt 1800
gggcggcacc attgtctcga ccgcgctggc ggtgctggcc gcgcgcggcg agcacccggc 1860
cgccagcgtc acgctgctga ccacgctgct ggactttgcc gacacgggca tcctcgacgt 1920
ctttgtcgcc gagggccatg tgcagttgcg cgaggccacg ctgggcggcg gcgccggcgc 1980
gccgtgcgcg ctgctgcgcg gccttgagct ggccaatacc ttctcgttct tgcgcccgaa 2040
cgacctggtg tggaactacg tggtcgacaa ctacctgaag ggcaacacgc cggtgccgtt 2100
cgacctgctg ttctggaacg gcgacgccac caacctgccg gggccgtggt actgctggta 2160
cctgcgccac acctacctgc agaacgagct caaggtaccg ggcaagctga ccgtgtgcgg 2220
cgtgccggtg gacctggcca gcatcgacgt gccgacctat atctacggct cgcgcgaaga 2280
ccatatcgtg ccgtggaccg cggcctatgc ctcgaccgcg ctgctggcga acaagctgcg 2340
cttcgtgctg ggtgcgtcgg gccatatcgc cggtgtgatc aaccccgccgg ccaagaacaa 2400
gcgcagccac tggactaacg atgcgctgcc ggagtcgccg cagcaatggc tggccggcgc 2460
catcgagcat cacggcagct ggtggccgga ctggaccgca tggctggccg ggcaggccgg 2520
cgcgaaacgc gccgcgcccg ccaactatgg caatgcgccc tatcgcgcaa tcgaacccgc 2580
gcctgggcga tacgtcaaag ccaaggcatg acgcttgcat gagtgccggc gtgcgtcatg 2640
cacggcgccg gcaggcctgc aggttccctc ccgtttccat tgaaaggact acacaatgac 2700
tgacgttgtc atcgtatccg ccgcccgcac cgcggtcggc aagtttggcg gctcgctggc 2760
caagatcc 2769

<210> 14
<211> 1980
<212> DNA
<213> Acinetobacter sp.

<400> 14
ctgaattcaa atcggaattt gaaaagttag ttagcgaatc tatgcctaac aataaataac 60
actgctctga aaaccatgcg ttatcaggac gaatgttacg gggaagtgtg aaaatttccc 120
cgttttagtt tcagccctgc actcaatttg attgctaaaa gccatgtgct atggagcgat 180
gaaatgaacc cgaactcatt tcaattcaaa gaaaacatac tacaatttttt ttctgtacat 240
gatgacatct ggaaaaaatt acaagaattt tattatgggc aaagcccaat taatgaggct 300
ttggcgcagc tcaacaaaga agatatgtct ttgttctttg aagcactatc taaaaaccca 360
gctcgcatga tggaaatgca atggagctgg tggcaaggtc aaatacaaat ctaccaaaat 420
gtgttgatgc gcagcgtggc caaagatgta gcaccattta ttcagcctga aagtggtgat 480

cgtcgttttc acagcccatt atggcaagaa cacccaaatt ttgacttgtt gtcacagtct 540
tatttactgt ttagccagtt agtgcaaaac atggtagatg tggtcgaagg tgttccagac 600
aaagttcgct atcgtattca cttctttacc cgccaaatga tcaatgcgtt atctccaagt 660
aactttctgt ggactaaccc agaagtgatt cagcaaactg tagctgaaca aggtgaaaac 720
ttagtccgtg gcatgcaagt tttccatgat gatgtcatga atagcggcaa gtatttatct 780
attcgcatgg tgaatagcga ctctttcagc ttgggcaaag atttagctta caccctggt 840
gcagtcgtct ttgaaaatga catttttccaa ttattgcaat atgaagcaac tactgaaaat 900
gtgtatcaaa ccccctattct agtcgtacca ccgtttatca ataaatatta tgtgctggat 960
ttacgcgaac aaaactcttt agtgaactgg ttgcgccagc aaggtcatac agtcttttta 1020
atgtcatggc gtaacccaaa tgccgaacag aaagaattga cttttgccga tctcattaca 1080
caaggttcag tggaagcttt gcgtgtaatt gaagaaatta ccggtgaaaa agaggccaac 1140
tgcattggct actgtattgg tggtacgtta cttgctgcga ctcaagccta ttacgtggca 1200
aaacgcctga aaaatcacgt aaagtctgcg acctatatgg ccaccattat cgactttgaa 1260
aacccaggca gcttaggtgt atttattaat gaacctgtag tgagcggttt agaaaacctg 1320
aacaatcaat tgggttattt cgatggtcgt cagttggcag ttaccttcag tttactgcgt 1380
gaaaatacgc tgtactggaa ttactacatc gacaactact taaaaggtaa agaaaccttct 1440
gattttgata ttttatattg gaacagcgat ggtacgaata tccctgccaa aattcataat 1500
ttcttattgc gcaatttgta tttgaacaat gaattgattt caccaaatgc cgttaaggtt 1560
aacggtgtgg gcttgaatct atctcgtgta aaaacaccaa gcttctttat tgcgacgcag 1620
gaagaccata tcgcaccttg ggatacttgt ttccgtggcg cagattactt gggtggtgaa 1680
tcaaccttgg ttttaggtga atctggacac gtagcaggta ttgtcaatcc tccaagccgt 1740
aataaatacg gttgctacac caatgctgcc aagtttgaaa ataccaaaca atggctagat 1800
ggcgcagaat atcaccctga atcttggtgg ttgcgctggc aggcatgggt cacaccgtac 1860
actggtgaac aagtccctgc ccgcaacttg ggtaatgcgc agtatccaag cattgaagcg 1920
gcaccgggtc gctatgtttt ggtaaatttа ttctaatcgg tcatataaca acagccatgc 1980

<210> 15
<211> 4936
<212> DNA
<213> Alcaligenes latus

<400> 15
ggttcttctc gttccggcgg gaccgggtca cggggcggca ggctgccgcc gtctggctgc 60
gcggatgaag cggtgtcctc ggcgcgcttg cgcgcccgtc gccgcgccgg cgtccccagg 120
aagtacagga cgatggacaa gggcagtacg ccatacagca gcagcgtgaa caccgcgccg 180
agcaaggtgc cgttgggcgc catggcttcg gccacggcca tcatcagcac cacgtacagc 240
catgccagag caaccaagta catagcaaaa acccgcaatt acgcagaatg acgtatttcg 300
tacaatgaaa actgttgtca tgatgcggta agacacgaag cctacaacgc gatccagcaa 360
cggttttcgt gaaaaagtcc tcaggagacg agcgtgacac tgcatcccat tcccgcactg 420
caacagcttg gcgacaacgc cacggcgctg agtgccgcca tctcggaagc gctgcgcgcg 480
atgtcgggcc tgaacctgcc gatgcaggcc atgaccaagc tgcagggcga gtacctcaac 540
gaggcgacgg cgctgtggaa ccagacgctg ggccgcctgc agcccgacgg cagcgcccaa 600
ccggccaagc tgggcgaccg gcgcttctcg gccgaggact gggccaagaa ccccgccgcg 660
gcctacctgg cgcaggtcta cctgctcaat gcccgcacgc tgatgcagat ggccgagtcc 720
atcgagggcg acgccaaggc caaggcgcgc gtgcgcttcg ccgtgcagca gtggatcgac 780
gccgcggcgc cgagcaactt cctggcgctc aatcccgagg cgcagcgcaa ggcgctggag 840
accaagggcg agagcatcag ccagggcctg cagcagctgt ggcatgacat ccagcagggc 900
cacgtgtcgc agacggacga gagcgtgttc gaggtgggca agaacgtcgc caccaccgag 960
ggcgcggtcg tgtacgagaa cgacctgttc cagctcatcg agtacaagcc gctgacgccc 1020
aaggtgcacg agaagccgat gctgttcgtg ccgccgtgca tcaacaagta ctacatcctg 1080
gacctgcagc cggacaacag cctcatccgc tacaccgtcg cccagggcca ccgggtgttc 1140
gtggtgagct ggcgcaaccc cgacgcctcc gtcgccggca agacctggga cgactacgtg 1200
gagcagggcg tgatccgcgc catccgcgtg atgcagcaga tcacgggggca cgagaaggtc 1260
aacgcgctgg gcttctgcgt cggcggcacc atcctgagca cggcgctggc ggtgctggcc 1320
gcgcgcggcg agcagccccgc ggcgagcctg acgctgctga ccacgctgct ggacttcagc 1380
aacaccggcg tgctggacct gttcatcgac gaggccggcg tgcgcctgcg cgagatgacc 1440
atcggcgaga aggcgcccaa cggcccgggc ctgctcaacg gcaaggagct ggccaccacc 1500
ttcagcttcc tgcgcccgaa cgacctggtc tggaactacg tggtgggcaa ctacctcaag 1560
ggcgaggcgc cgccgccctt cgacctgctg tactggaact ccgacagcac caacatggcc 1620

```
gggcccatgt tctgctggta cctgcgcaac acctacctgg agaacaagtt gcgcgttccc 1680
ggtgccctga ccatctgcgg cgagaaggtg gaccctctgc gcatcgaggc gccggtgtac 1740
ttctacggtt cgcgcgagga ccacatcgtg ccctgggaat cggcctacgc cggcacgcag 1800
atgctgagcg gccccaagcg ctatgtcctg ggtgcgtctg gccacatcgc cggcgtgatc 1860
aaccccccgc agaagaagaa gcgcagctac tggaccaacg agcagctcga cggcgacttc 1920
aaccagtggc tggaaggctc caccgagcat cctggcagct ggtggaccga ctggagcgac 1980
tggctcaagc agcacgcggg caaggaaatc gccgcaccca agactccccgg caacaagacc 2040
cacaagcccc tcgagcccgc ccccgggcgt tacgtgaagc agaaggcctg agccgcggcc 2100
cctgagcctt ctttaacccg accttgacaa acgaggagat aagcatgacc gacatcgtca 2160
tcgtcgccgc agcccgcacc gccgtgggca agttcggcgg cacgctggcc aagacccccg 2220
ctccggagct gggcgccgtg gtcatcaagg ccctgctgga gaagacgggc gtcaagcccg 2280
accagatcgg tgaagtcatc atgggccagg tgctggccgc cggcgcgggc cagaaccccg 2340
cgcgccaggc gatgatgaag gcgggcatcg ccaaggaaac gccggcgctg accatcaacg 2400
ccgtgtgcgg ctccggcctc aaggccgtga tgctggccgc ccaggccatc gcctggggcg 2460
acagcgacat cgtcatcgcc ggcggccagg agaacatgag cgccagcccg cacgtgctga 2520
tgggcagccg cgacggccag cgcatgggcg actggaagat ggtcgacacc atgatcaacg 2580
acggcctgtg ggacgtgtac aacaagtacc acatgggcat cacggccgag aacgtcgcca 2640
aggaacacga catcagccgc gaccagcagg acgccctggc cctggccagc cagcagaagg 2700
ccaccgccgc gcaggaagcc ggccgcttca aggacgagat cgttccggtc tcgatccccgc 2760
agccgcaaggg cgacccggtg ctgttcgaca ccgacgagtt catcaacaag aagaccaccg 2820
ccgaagcgct ggcgggcctg cgcccggcct tcgacaaggc cggcagcgtg accgcgggca 2880
acgcctcggg catcaacgac ggcgccgctg cggtgatggt gatgtccgcc gccaaggcga 2940
aggagctggg cctgacgccc atggcgcgca tcaagagctt cggcaccagc ggcctggatc 3000
cggccaccat gggcatgggc ccggtgccgg cctcgcgcaa ggcgctggag cgcgccgct 3060
ggcaggtcgg tgacgtggac ctgttcgagc tcaacgaagc cttcgccgcc caggcctgcg 3120
cggtgaacaa ggagctgggc gtggatccgg ccaaggtcaa cgtcaacggc ggtgccatcg 3180
ccatcggcca ccccatcggc gcctccggct gcgcgtgct ggtgacgctg ctgcacgaga 3240
tgcagcgccg ggacgccaag aagggcctgg ccgcgctgtg catcggcggc ggcatgggcg 3300
tgtcgctgac cgtcgagcgc tgatcagaag aaccgggcgg ccccgcgccg cccgccccgc 3360
gttccacgcg ggtgcgccgg gataccagac gaaccaaacc accaagggct tcgagacggc 3420
ccgaagaagg agagacagat ggcacagaaa ctggcttacg tgaccggcgg catgggcggc 3480
atcggcacct cgatgtgcca gcgcctgcac aaggacggct tcaaggtgat cgccggctgc 3540
ggtccgagcc gcgaccacca gaagtggatc gatgaacagg ccgcgctggg ctataccttc 3600
tacgcctccg tgggcaacgt ggccgactgg gactccaccg tggccgcctt cgagaaggtc 3660
aaggccgagc acggcaccgt ggacgtgctg gtgaacaacg ccggcatcac gcgtgacggg 3720
cagttccgca agatgagcaa ggccgattgg caggccgtga tgtcgaccaa cctcgacagc 3780
atgttcaacg tcaccaagca ggtgatcgag ggcatgctgg acaagggctg gggccggatc 3840
atcaacatct cctcggtcaa cggccagaag ggccagttcg gccagaccaa ctactccgcc 3900
gccaaggccg gcatgcacgg cttctcgatg gcgctggccc aggaagtggc ggccaagggc 3960
gtgacggtga acaccgtgag ccccggctac atcgccacgg acatggtcaa ggccatccgc 4020
caggacgtgc tggacaagat catcgccacc attcccatcc gtcgcctggg tacgccggag 4080
gagatcgcct ccatcgtcgc ctggctggcc ggcgaggagt cgggcttcac caccggtgcc 4140
gacttcagct gcaacggcgg cctgcacatg ggctgaggcc cgcggctcca tgcccacctg 4200
cgtgggcatg gacgggccga aggacccgag ctctgcgagg gtgcggcctg caaggctgag 4260
gcctgctgcg ccgcgtgccc gcgagggcac gtgccgaagc accaaaaggc cgcgcattgc 4320
gcggcctttt cctttctgga tcggtgcgga cgggtgccgc gtcaggcagg gcagggcccc 4380
cgggccttca ctccaccatg cccgacatga agtacttgat cagccccttg gccgcgaagc 4440
ccagcatgcc gaagcccagc gccaggaaca gcacgaaggt gccgaacttg ccggccttcg 4500
actcgcgcgc gagctgaaag atgatgaatg ccatgtagag catgaaggcc gtgacgccga 4560
cggtcaggcc cagctgggca atgttttcct cgttgatttc gaacatcgtt tgttgtctca 4620
ggctgctgca cgcggctgac gtgctcgccg cgcggccggg ccccaactgc ccgcagcggt 4680
tctcgatcag gttctcaagg catctcgtgc cactgggagg tgtccaccag gtcgcggtag 4740
gcgtgccagc tcgaatgcgc cagccacggc actaccacga tcaggcccag cagcagcgtg 4800
gccatgccca gcagcgtcag cgccatgatc agcgccgccc acagcgccag cggcagtggg 4860
tgctgcatca ccacgcgcca gctcgtgagc accgccacca gcacgcccac gtggcggtcc 4920
agcagcatcg ggatcc                                                 4936
```

<210> 16
<211> 1752

<212> DNA
<213> Azorhizobium caulinodans

<400> 16
atggaggcgt tcgcccagaa ccttgcgaag atggtggagg aaggcggcaa ggccgtcgcc 60
gcttacatgc gtccgcgcga ggagggcaag ccggacgaca tgaccggacga tatcgccgat 120
gcgctcaaga ccatcggcga ggtggccaat tactggatgt ccgatccaaa gcgctccttc 180
gaggcccagt cgcgcctcat gatgggctac atgggcgtct gggcgggggc gctccagaag 240
ctctccggcg agaaggccga gcccatcgcg aaggccgacc ccaaggacgg ccgcttcaag 300
gaccccggaat gggaaagccc gttcttcgac gccctgaagc agaccctatct cgtgaccagc 360
aactgggccg agtccatggt caaggaggcc gagggcgtcg atccccacac caagcacaag 420
gccgaattcc tggtgcgcca gctctcgaat gcggtgggcg ccttcgaactt cctcatgacc 480
aaccccggagc tgatccgcga aacgctctcc tccagcggcg agaacctcgt gcgcggcatg 540
aagaatctgg ccgaggatct ggtggagggc aaaggcgatc tcaagatccg ccagacggac 600
atgagcgcct tcgaggtggg ccgcaatctg gcgctcagcc ccggcaaggt catcttcgag 660
accgagctga tgcagctcat ccagtatgcg ccctcgacgc ccagcgtgaa gaagacgccg 720
gtgctgatcg tgccgccctg gatcaacaag ttctacatcc tcgacctgac gcccgagaaa 780
tccctcatca agtggatggt ggatcagggg ctgacggtct tcgtcatctc gtgggtcaat 840
ccggacgccc gtctcgccga caagggcttc gacgactaca tgcgcgatgg catcttcgcc 900
gcgctcgatg cggtggagaa ggcgaccggc gagcatcagg cgcacaccat cggctattgc 960
gtgggcggca cgctgctcgc ggtcacgctt gcctacatgg cggcgaccgg cgatgaccgg 1020
gtggcgagct ccaccttcct caccacccag atcgacttca cccacgcggg cgatctcaag 1080
gtcttcgtgg acgaggcgca gctctcggtc atcgagcgtc gcatgaagga gatgggctat 1140
cttgaaggac gcaagatggc cgacgccttc aacatgctgc ggtccaacga cctgatctgg 1200
ccctatgtgg tgaacaatta tctcaagggg aagcagccgt tcccccttcga tcttctgttc 1260
tggaatgccg attccaccgg catgcggcgg gcgaaccact cctattacct gcgcaactgc 1320
tatctccaga acaacatcgc caaggggctg gcggagatcg cgggcgtcaa gatcgacatg 1380
ggcaaggtga cgatcccggt ctattcgctc gccacccgcg aggaccatat cgcgccgccc 1440
aactccgctt atatcggtgc aggcctgctc ggcggccccg tgcgcttcgt gctggccggg 1500
tccggccata ttgcgggcgt ggtcaatccg ccggtgaagc acaagtacca gtactggacc 1560
ggcggtccga ccggcgggga ctatgacgtc tggctgaagg gggcgcagga gcacaaggac 1620
tcgtggtggc cggattgggc gcagtggttc agcgccctgc atccggacga ggtccctgcc 1680
cgcgagccag gcggcagcgc gttcaatccc atcgaggatg cccccggccg ctacgtacgc 1740
gagaagtcct ga 1752

<210> 17
<211> 3973
<212> DNA
<213> Comamonas acidovorans

<400> 17
cccgggcaag cggcgcagca gaccctggcc tggctgggac cctgcatcgg tccgcgctcc 60
ttcgaagtgg gagccgaggt gcgcgcggcc ttcatcgcgc atgacgcggc ggccgggccg 120
catttcaccg ccgtggcgca agagggcggg ggcgcaccca agtacctggc caacctggcc 180
gggcttgcgc gccagcgcct ggcggcgctg ggcatcaccg ccatctacgg caatgacggc 240
ggcgacgcat ggtgcacggt gctcaacggc tcacggttct tttcgcaccg gcgcgacgct 300
gcccgcctcg gcagcagcgg ccggttcgcc gcctgcatct ggaaggactg agcgcgcctg 360
cgtgccgggg ccgttttgcg aggcctgctg ctgcgcgagc caggcctcgc gctcggccaa 420
ttcgcgtgca tggcgtttte gcttgcgcgc gggcgtgccc atgatgtaga tcacgatcga 480
cagcggcagc agtccgtaga gtgcgaacgt gatcacggcg ccgagtatgc tgcccgtggg 540
gctggcggcc tcggccactg ccatcatcag agtgacatac agccaggcga taacaacgag 600
atacatggtc gaaccaaaaa aacgagcggg gcacgggttt tcgtggaggt ctgtgccggg 660
caaggcgggg ctcgcctggg tcacaatcaa aacggatgcc ccgcaagccc caggctattg 720
catggcatcc acgaacaagg atgcagcatg aattttgacc cactcgctgg cctgtcaggc 780
caatccgtcc agcaattctg gaacgagcaa tggagccgca cgctgcagac actgcagcag 840
atggggcaac caggccttcc gggaatccag ggcatgccag gcatgccgga catggcccag 900
gcctggaaag cggccgtccc cgaacccggc gccctgcccg agaacgcgct gtcgctggac 960
cccgaaaagc tgctggagct gcagcgccag tacctggatg gcgccaaggc catggccgaa 1020
cagggcggcg cccaggcgct gctggccaag gacaagcgct tcaataccga atcgtgggcc 1080

```
ggcaaccccgc tgacggcggc cacggccgcc acctatctgc tcaacagccg catgctcatg 1140
ggcctggccg atgccgtgca ggccgatgac aagacgcgca accgcgtgcg cttcgccatc 1200
gagcaatggc tggcggccat ggcgcccagc aacttcctgg cactcaatgc cgaggccccag 1260
aagaaggcca tcgaaacccca gggcgagagc ctggcccagg gcgtggccaa cctgctggcc 1320
gacatgcgcc agggccatgt gtccatgacc gacgagagcc tgttcaccgt gggcaagaac 1380
gtcgccaccg ccgaaggcgc cgtggtgttc gagaacgagc tgttccagct catcgaatac 1440
aagccgctga cggacaaggt gcacgagcgg ccccttcctca tggtgccgcc ctgcatcaac 1500
aagttctaca tcctggacct gcagcctgac aactcgctga tccgctacgc cgtcagccag 1560
ggccatcgca ccttcgtgat gagctggcgc aaccccgacg aaagcctggc gcgcaagacc 1620
tgggacaact acatcgagga cggcgtgctc accggcatcc gcgtggcgcg cgagatcgcg 1680
ggagccgagc agatcaatgt gctgggcttt tgcgtgggcg gcaccatgct gtccaccgcg 1740
ctggcggtgc tgaaggcacg ccacgaccgc gagcatggcg cagttgctgc tccggcggcc 1800
aaggcgcctg cggccaagcg cgcggctggc agccgcagcg ccgcccgcac atccacagcc 1860
cgcgccacgg cgccggccgg cgtgccgttt ccgtggccca gcgtccacgct gctgaccacc 1920
ttcatcgact tcagcgacac cggcatcctc gatgtcttca tgacgaatc cgtggtgcgc 1980
ttccgcgaga tgcagatggg cgaggcgcgc ctcatgaagg gccaggacct ggcgtccacc 2040
ttcagcttcc tgcggcccaa cgacctggtc tggaactacg tggtgggcaa ctacctcaag 2100
ggcgagacgc ccccgccgtt cgacctgctg tactggaaca gcgactccac caacctgccc 2160
ggccccatact acgcctggta cctgcgcaac ctctacctgg aaaacaggct ggcccagccc 2220
ggcgcgctga ccgtctgcgg cgagcgcatc gacatgcacc agctgcgcct gccggcctat 2280
atctacggct cgcgcgagga ccacatcgtg cccgtgggcg gctcctatgc gtccacccag 2340
gtgctgggcg gcgacaagcg ttttgtgatg ggcgcgtcgg gccacatcgc gggcgtgatc 2400
aatccgccgg ccaagaaaaa gcgcaagtac tggctgcgcg aggacggcca gctgcccgcc 2460
acgctcaagg agtggcaggc cggcgccgac gagtacccgg gcagctggtg ggccgactgg 2520
agccccctggc tggccgagca cggcggcaag ctggtcgcgg cgccaaagca gtacggcaag 2580
ggcagggaat acacggccat cgagccggcc ccgggccgct acgtactggt caaggcctga 2640
ggcacaatcg tttcgatgct gcagcgcaat aacgcttcgg cttgaatgca gggtgccgct 2700
gccgcgactg cggccgcgtg cgcccaggca tcccttcaag agtccaaaga aaggtccgtc 2760
atcatggaag acatcgtcat cgtttccgct gtccgtactg ccgttggcaa gtttggcggc 2820
accettgcca agatccccgc caccgaactg ggctccatcg tgatccgcga ggcactgaac 2880
cgtgccaagg tcggcaccga tcaggtcggt gaagtcatca tgggccaggt gctggccgct 2940
ggcgcaggcc agaaccccgc acgccaggcc atgatgaagg ccggcgttgc caaggaaacc 3000
ccggccctca ccatcaacgc cgtcigcggc tcgggcctga aggccgtgat gctggcagcc 3060
caggccgtgg ccacgggcga cagcgagatc gtcgtggccg gcggccagga gaacatgagc 3120
ctgtcgcccc acgtgctgcc gggctcgcgc gacggccagc gcatgggcga ctggaagatg 3180
gccgacacca tgatcgtgga cggcctgtgg gacgtctaca accagtacca catgggcatc 3240
acggccgaga acgtggccaa ggaaaagagc gtcagccgcg agcagcagga tgccctggcc 3300
ctggccagcc agcaaaaggc cacggccgcg caggacgccg gcaaagttcgt ggacgaaatc 3360
gttccgtca gcattcccca gcgcaagggc gatccgtgg tgttcgctgc cgacgagtac 3420
atcaaccgca agaccaatgc cgacgccctg gcaggcctgc gccccggcctt cgacaaggcc 3480
ggctcggtga cggccggcaa cgcctcgggc ctgaacgacg gcgcggccgc cgtggtgctg 3540
atgagcgcct ccaaggccaa ggccctgggc ctgacgccgc tggcgcgcat cgtctcctac 3600
gccaccagcg gcctggaccc cgccaccatg ggcctgggcc cggtgttcgc ctcgcgcaag 3660
gcgctggagc gtgcgggctg gaccgcgcag gacgtggacc tgttcgagct gaacgaagcc 3720
ttcgcggccc aggcctgtgc ggtgaaccag gagctgggca tcgacccggc caaggtcaac 3780
gtcaacggcg gcgccattgc catcggccac cccatcggcg catcgggcgc ccgcatcctg 3840
gtgaccctgc tgcacgagat gcagcgcagc ggcgccaaga agggcctggc cggcctgtgc 3900
atcggcggcg gcatgggcgt ggccatggcg gtggagcgcg tttgagaggc tccgggaaaa 3960
cgttagcaag ctt                                                    3973


<210> 18
<211> 3690
<212> DNA
<213> Methylobacterium extorquens

<400> 18
cgtgtccggg ttgaggctca ccccgaagcg ccgctggtag tagccggcct gggcgcggcg 60
caggccggca atgcccttgg aggcggagta gcggtcggtg cgcggcttgc cggccgtctc 120
gacgagcttc tcgatgacgt ggcgggggcgc gtcgagatcg ggattgccca tgccgagatc 180
```

```
gatgatgtcg gcgccgcggg ctcgggcggc ggccttgatc cggttcacct gctcgaagac 240
gtaaggcgga aggcgcttga tgcggtggaa atcggtcatg gcgttggtct gtccggtgtc 300
gcggaactga tcctccgcg aggatgcgtc ggcggtgagg agcctgcctg tttaccatcg 360
acgcgttcac gcgccgactt aaaaatcaac atcgcgaggc cccgccacga tcggggtgga 420
acgatcacta caccgggttg ggcgcgagcc cctgcgcggc attcttggcc gccccttccg 480
ccgcgcgccc tttggactcg ttgcggttgc gcgcgccttc cagctcggcc tgcagagcgc 540
tttgtccggc cgaattgcgg gcgcggacgg cgcgccgggg cgccgattcg cctaccggca 600
tgtagctcgc atcgcctctg cgggattgcg gccacgaaat cgggcgcctc caccggcttg 660
atgccggagc ccgccccgac catcgccgcc ttcagcggat tcacgtcgcc ggagcagccg 720
ccggtcgccg ccgcggcggc gaaaaccggc aaggcgatgg cgatggcgcg gacggtgcgg 780
cgcacgttca tgacaacggt ctgaaaatgg agtctgggat gggcgacttc tgctgggtgg 840
agcgttaatt tgtcggaaac gaggctcggg ccgccccacg gggcgggatg cgggcagacc 900
tttgggagga cgtgtcgcgt gggcaccgag cggacgaacc cggcagcgcc ggatttcgag 960
accatcgcgc gcaacgcgaa tcagctcgcg gaggtgttcc ggcaatcggc cgccgcctcg 1020
ctgaagccgt tcgagccggc gggccaggga gccctgctcc cgggcgcgaa cctccagggc 1080
gccagcgcga tcgacgagat gaccccggacc ctcacgcggg tcgcggagac atggctgaag 1140
gatccccgaa aggcgcttca ggcccagacc aagctcggcc agtccttcgc cgcgctctgg 1200
gcctcgaccc tgaccccgat gcaggggcgc gtcaccgagc ccgtcgtcca gccccccgcc 1260
acggacaagc gcttcgccca tgccgattgg agcgcgaacc cggtcttcga cctgatcaag 1320
cagagctacc tgctccttgg ccgctgggcc gaggagatgg tcgagacggc cgaaggcatc 1380
gatgagcaca ccccgccacaa ggcggagttc tacctgcgcc agctcctctc ggcctactcg 1440
ccctcgaact tcgtgatgac gaaccccgag ctcctgcgcc agacgctgga ggaggggggc 1500
gccaacctga tgcgcggcat gaagatgctg caggaggatc tggaagccgg cggcggtcag 1560
ctccgggtgc ggcagacgga cctgtccgcc ttcaccttcg gcaaggacgt ggcggtgacc 1620
cccggcgagg tcatcttccg caacgatctg atggagttga tccagtacgc gccccacgacc 1680
gagacggtgc tgaagcgtcc gctgctgatc gtgccgccct ggatcaacaa gttctacatc 1740
ctcgatctca accccagaaa gagcctcatc ggctggatgg tgtctcaagg gatcacggtg 1800
ttcgtgatct cctgggtgaa ccccggacgag cgccaccgcg acaaggactt cgagtcctac 1860
atgcgggaag gcatcgagac cgccatcgac atgatcggcg tggcgaccgg cgagaccgat 1920
gtcgcggcgg cgggctactg cgtcggcggc acgctgctcg ccgtcacgct ggcctaccag 1980
gcggcgaccg gcaaccgccg gatcaagagc gcgaccttcc tcaccacgca ggtcgatttc 2040
acccatgcgg gcgatctcaa ggtcttcgcc gacgaggggc agatcaaggc gatcgaggag 2100
cggatggccg agcacggcta cctggagggc gcgcgcatgg ccaacgcctt caacatgctc 2160
aggcccaacg acctgatctg gtcctacgtc gtcaacaact acgtacgcgg caaggcgccg 2220
gccgccttcg acctgctcta ctggaacgcc gacgccacgc ggatgccccc ggccaaccac 2280
tcgttctacc tgcgcaactg ctacctcaac aacacgctcg ccaaggggca gatggtgctc 2340
ggcaacgtgc gcctcgacct caagaaggtg aaggtgccgg tcttcaacct cgccacccgc 2400
gaggaccaca tcgccccggc gctctcggtc ttcgaaggat cggccaagtt cggcggcaag 2460
gtcgattacg tgctggcggg ctcgggccac atcgccggcg tcgtcgcccc gccgggcccc 2520
aaggccaaat acggctttcg caccggcggc ccggccccgag gccggttcga ggattgggtc 2580
gcggcggcga cggagcatcc gggctcgtgg tggcctctact ggtacaagtg gctcgaggag 2640
caggcgcccg agcgcgtgcc cgccgcatt cctggaacgg gggcctcgcc ttcctggcg 2700
ccagcaccgg gcacctatgt ccgcatgaag gcgtgagggc atgaaggtgt gagggatcga 2760
caggaaccgt gcacgcactg catcgctgtt gcggacacgg gaccgtgatt tgccttatct 2820
gatcctgggg ccggctcctg ccccaggagg atagaagcgc gttgcaaacac gccaccgatc 2880
tcatttcgat catcgcgctg gggctggtct gcgcgttcat cggcggcatg ctggcccagc 2940
gaatgcggct tccccccgctc gtcggctacc tcgtcgccgg catcgccatc ggcccgttca 3000
cgcccgggttt cgtcggcgat ccggctttag cgagccagct cgccgaactc ggcgtcatcc 3060
tgctgatgtt cggcgtcggg cttcacttct ccatcggtga cctactcgcg gtccgcacca 3120
tcgccctgcc cggtgcgatc gtgcagatca ccgtggcgac cgccatgggc gcgggtctcg 3180
cctgggggctt cggctggggg gccgggggcgg gcctcgtgtt cgggctggcg ctctcggtgg 3240
cgagcactgt cgtgctgttg cgggcgctcg aagggcaggg gcttctcgac tcggacaagg 3300
gccgcatcgc cgtcggctgg ctgatcgtcg aggatctcgc catggtggtg gccctggtgc 3360
tgctgccggc gttggcgccc tcgctcggcg gcgaggcgat gcaggccgcc ggccatcacg 3420
gcccgccgga gcacggcctg tgggtgacgc tcgggctgac gctcgccaag gtcggcgtgt 3480
tcgtcgccgt gatgcttgtc ggcgggcggc gcctcattcc ctacctgctg ggtctggccg 3540
cccgcaccgg ctcgcgcgag ctgttcaccc tggccgtgct ggcgagcgcc gtcggtatcg 3600
ccttcgcctc ctccgagctg ttcggcgtgt ccttcgccct cggcgcgttc ttcgccggga 3660
tggtgctcgc cgaatccgac ctcagccatc                                  3690
```

<210> 19
<211> 2712
<212> DNA
<213> Paracoccus denitrificans

<400> 19
gggcccgcgc gctggcgccc atccattcat tggtgttgcg gatcgtctcc atcgcatcat 60
agagagatga tccctctcaa acccttgtac gtcgtcattg caacctttct ccatgaaccc 120
gccggattcg gccttgccgg ggaaggacac ggctttacct gcgtattgtg ctgggcataa 180
tgattttacg gttcagggag gattgtcaat tatggcgggc aaggacgaaa aacccgaagc 240
tgcgggcgcg gccgaagccg ggggcaaacc acgcaggggc cgcgggggcag gggccaaggg 300
ccgtaccggg gacagcgaaa caggagccga agcctgccga ttcggaaaag ccggcgcgac 360
cgcggcgcga aaaggccgcg gtgaagaccc cgcccgagcc cgtgcccgag cccgcggcgc 420
ctgccaggtc caaggcggcc gcggcctccg atcccgccaa gcctgccgcc aaggccggca 480
cacgcaaacg ccgcgttgcg cgcgggcggg ggccggtcgc agcgatccgc gccccggtcc 540
gcgccgaaag ccctcgggca aggccgccgc gaaggcgcag gccgagaccg cctcgctcag 600
tatggccgac gaggcgctgc gtccgctggg cgccgtcgga ccgggcggcg gcgtgccgcc 660
catggccgcg ccccgcgccc aggctgccgc cccggcgggg accggccagt ctgccggact 720
cgctgccgag ccgcatccag ccccgaacac gccgccttcg tcgaggcggc cttcggtccc 780
ggcagccgcc tcccaacagc tggcccagaa catcgagcgc atcgaatcgc tgacccagcg 840
cctgatcagc gcgctggcgc agcgccgtcc ctcgaatccc ggcgtcgaga tgccgggccc 900
cgaccttttc gccaccgcga cctcggcctg gatcaagctt ctggccgagc agccccgagcg 960
ggtgatcggc cagcaggtca gctattgggg cgaaaccttg cgccatttcg ccgaggcccca 1020
ggccgccttt gcccgcggca ccgtgacgcc gccgcccagc gaagggccgc gggaccggcg 1080
ctttgccaac ccgctgtggg aggcgcatcc cttcttcaac ttcatcaagc ggcaatacca 1140
gatcaacgcc caggccctgc aggaggcggc cagcacactg gacctgcccg agatgaccga 1200
ccggcgccgg atcgaatggt tcacccgcca gatgatcgac atgatggcgc cgacgaattt 1260
tctggccacc aatcccgacg acagctggaa aaggcgctgg agaccgaggg acgaaagcct 1320
ggtcagcggc cttgagaacc tggtgcgcga cgtcgagcag aacagcggcg agctgatcgt 1380
gtcgctggcc gaccgcgatg ccttccgtgt gggcgagaac atcggcacca ccgagggcac 1440
ggtggtcgcg cgcaccaagc tttacgagct gatccagtac aagcccacca ccgcgcaggt 1500
gcatgagatc ccgctggtga tctttccgcc ctggatcaac aaattctaca tcctcgacct 1560
caagccgcag aacagcctga tcaaatggat cgtggaccag ggccatacgc tgttcgtggt 1620
ggcctggaag aaccccgacc ccagctatgg cgacaccggc atggacgatt acgtcagcgc 1680
ctatctggag gtgatggacc gggttctgga tctgaccgac cagaaaaagc tgaatgcggt 1740
gggctattgc atcgccggca ccaccctggc gctgaccccc gtcgtgctga agcagcgcgg 1800
cgacgaccgg gtgaacgcgg ccaccttctt caccgcgctg accgatttcg ccgaccaggg 1860
cgagttcact gcctatctgc aggaggattt cgtctcaggc atcgaggagg aggcggcgcg 1920
gaccggcatc ctgggcgcgc agctgatgac gcgcaccttc agcttcctgc gcgccaacga 1980
cctggtctgg gggccggcga tccgcagcta catgctgggc gagacgccgc cggccttcga 2040
cctgctgttc tggaacggcg acggcaccaa cctgcccggg cgcatggccg tggaatacct 2100
gcgcggcctg tgccagcaga accgcttcgt caaggagggg ttcgatctga tgggccaccg 2160
cctgcatgtc ggcgacgtga ccgtgccgct ttgcgccatc gcctgcgaga ccgaccatat 2220
cgcgccctgg aaggacagct ggcgcggcat cgcgcagatg ggctccaggg acaagaacct 2280
catcctgtcc gaatcgggcc atatcgccgg catcgtcaac ccgcccagca agaagaaata 2340
cggccattat acctcggacg ccggtttcgg tcagggcgag cagcactggc tggacaaggc 2400
cagccatcac gagggcagct ggtgggccg ctggggcgaa tggctggccc ggcgggcggg 2460
ggycatggtc gatgcccgcg acccgggcga gggcttcggc cctgcgccgg gcctttacgt 2520
ccacgagcgg gcgtaaaatt tttctgcacc gcagcaagaa aaccttgcaa tgctgcggtg 2580
cagaaagtat atgttggaca gaacagttca accggtgccg aagcttcgcg ccgacctagg 2640
agagagcaaa tggccaagac ccctgacttt accaagacca tgcaagaagt tatggcgaaa 2700
ttcccggtcg ac 2712

<210> 20
<211> 2587
<212> DNA
<213> Zoogloea ramigera

<400> 20
gtcgacctgg gcaaggtcgg gccgcagcaa gtgcccgagg cggacgccag catgaccacc 60
atcgccggca aggtgtgctg gtgatgacgg ccgactgcct gccggtgctg ttttgcgaca 120
cgcgcggcac cgttcgtggc tgcccgccac gccggtcggc gcggcctggc cgctggcgtg 180
ctggaaaaca cctacgcgag cagtgcgcgt ccgcggcgcc ggcgactgat ggcctggatg 240
gggccggcca tcggcgccta ccagttcgag gtgggcggcg atgtgcgcca ggcctttctg 300
caaaccgcac ctgacgattc aagcgtgcgg cacgtgacgg cagcgtttac gccactcgaa 360
caccggccgg gcaagttcct ggccgacatc tacgcgctgg ccccggcatcg catgctgcgc 420
gccggcgtgg cgcaagtgca tggcggcgaa tactgcacgg tggccaattc cgggcgcttc 480
tattcgttcc gtcgcgacgg cgtcaccgga cgccaggcaa gtttgatctg gctcaaataa 540
gtatcaggta gggggcgctg gacttttttag cgtctcgcgc cgcctgtcgc gctttgcggc 600
gtgctttctc ttgccccgttc ccgcgatgta aatcaaggtc cccagcggca gcacgcaata 660
gaacaaaaac gcaatagcaa caatcagcat gtagcaaccc aggttaagag atattcaata 720
ttttttttagg gaatcacaca tgaatttgcc cgatccgcaa gccattgcca acgcctggat 780
gtcccaggtg ggcgacccca gccaatggca atcctggttc agcaaggcgc ccaccaccga 840
ggcgaacccg atggccacca tgttgcagga tatcggcgtt gcgctcaaac cggaagcgat 900
ggagcagctg aaaaacgatt atatgcgtga cttcaccgcg ttgtggcagg attttttggc 960
tggcaaggcg ccagccgtcc agcgaccgcg cttcagctcg gcagcctggc agggcaatcc 1020
gatgtcggcc ttcaatgccg catcttacct gctcaacgcc aaattcctca gtgccatggt 1080
ggaggcggtg gacaccgcac cccagcaaaa gcagaaaata cgctttgccg tgcagcaggt 1140
gattgatgcc atgtcgcccg cgaacttcct cgccaccaac ccggaagcgc agcaaaaact 1200
gattgaaacc aagggcgaga gcctgacgcg tggcctggtc aatatgctgg gcgatatcaa 1260
tatgctgggc gatatcaaca acggccatat ctcgctgtcg gacgaatcgg cctttgaagt 1320
gggccgcaac ctggccatta ccccgggcac cgtgatttac gaaaatccgc tgttccagct 1380
gatccagtac acgccgacca cgccgacggt cagccagcgc ccgctgttga tggtgccgcc 1440
gtgcatcaac aagttctaca tcctcgacct gcaaccggaa aattcgctgg tgcgctacgc 1500
ggtggagcag ggcaacaccg tgttcctgat ctcgtggagc aatccggaca agtcgctggc 1560
cggcaccacc tgggacgact acgtggagca gggcgtgatc gaagcgatcc gcatcgtcca 1620
ggacgtcagc ggccaggaca agctgaacat gttcggcttc tgcgtgggcg gcaccatcgt 1680
tgccaccgca ctggcggtac tggcggcgcg tggccagcac ccggcggcca gcctgaccct 1740
gctgaccacc ttcctcgact tcagcgacac cgggtgctcg acgtcttgtc gagaaaccca 1800
ggtcgcgctg cgtgaacagc aattgcgcga tggcggcctg atgccgggcc gtgacctggc 1860
ctcgaccttc tcgagcctgc gtccgaacga cctggtatgg aactatgtgc agtcgaacta 1920
cctcaaaggc aatgagccgg cggcgtttga cctgctgttc tggaattcgg acagcaccaa 1980
tttgccgggc ccgatgttct gctggtacct gcgcaacacc tacctggaaa acagcctgaa 2040
agtgccgggc aagctgacgg tggccggcga aaagatcgac ctcggcctga tcgacgcccc 2100
ggccttcatc tacggttcgc gcgaagacca catcgtgccg tggatgtcgg cgtacggttc 2160
gctcgacatc ctgaaccagg gcaagccggg cgccaacccc ttcgtgctgg gcgcgtccgg 2220
ccatatcgcc ggcgtgatca actcggtggc caagaacaag cgcacgtact ggatcaacga 2280
cggtggcgcc gccgatgccc aggcctggtt cgatggcgcg caggaagtgc cgggcagctg 2340
gtggccgcaa tgggccgggt tcctgaccca gcatggcggc aagaaggtca agcccaaggc 2400
caagccccgc aacgcccgct acaccgcgat cgaggcggcg ccccgccgtt acgtcaaagc 2460
caagggctga ccacggggaa ctgccagact accggactcg gctattggaa gcgttgcaat 2520
aaatgccagc actattgcga gttttctgcaa tcttttctact ttcccctcta taataggatc 2580
cgtcgac 2587

<210> 21
<211> 3187
<212> DNA
<213> Aeromonas caviae

<400> 21
agatctggac cggggtgctg gcctgggcca cgccggcgag ggccagcgcg gagcaaccga 60
gcagcagggc gagaggtttc atcgggattc cttggcagtc tgaatgacgt gccagcctat 120
cagcgcgggcg ccggtgcggc gagggcgcgc cggacccagt gcgtcacctc tcgtctgatc 180
cgcctcccte gacgggcgtc gctgacaaaa aaattcaaac agaaattaac atttatgtca 240
tttacaccaa acccatttg gttgcagaat gctcaaacgt gtgtttgaac agagcaagca 300
acacgtaaac agggatgaca tgcagtaccc gtaagaaggg ccgattggcc cacaacaaca 360
ctgttctgcc gaactggaga ccgatgatga atatggacgt gatcaagagc tttaccgagc 420

agatgcaagg cttcgccgcc ccctcaccc gctacaacca gctgctggcc agcaacatcg 480
aacagctgac ccggttgcag ctggcctccg ccaacgccta cgccgaactg ggcctcaacc 540
agttgcaggc cgtgagcaag gtgcaggaca cccagagcct ggcggccctg ggcacagtgc 600
aactggagac cgccagccag ctctcccgcc agatgctgga tgacatccag aagctgagcg 660
ccctcggcca gcagttcaag gaagagctgg atgtcctgac cgcagacggc atcaagaaaa 720
gcacgggcaa ggcctgataa ccccctggctg cccgttcggg cagccacatc tccccatgac 780
tcgacgctac gggctagttc ccgcctcggg tgtgggtgaa ggagagcaca tgagccaacc 840
atcttatggc ccgctgttcg aggccctggc ccactacaat gacaagctgc tggccatggc 900
caaggcccag acagagcgca ccgcccaggc gctgctgcag accaatctgg acgatctggg 960
ccaggtgctg gagcagggca gccagcaacc ctggcagctg atccaggccc agatgaactg 1020
gtggcaggat cagctcaagc tgatgcagca caccctgctc aaaagcgcag gccagccgag 1080
cgagccggtg atcaccccgg agcgcagcga tcgccgcttc aaggccgagg cctggagcga 1140
acaacccatc tatgactacc tcaagcagtc ctacctgctc accgccaggc acctgctggc 1200
ctcggtggat gccctggagg gcgtccccca gaagagccgg gagcggctgc gtttcttcac 1260
ccgccagtac gtcaacgcca tggccccccag caacttcctg gccaccaacc ccgagctgct 1320
caagctgacc ctggagtccg acggccagaa cctggtgcgc ggactggccc tcttggccga 1380
ggatctggag cgcagccgcg atcagctcaa catccgcctg accgacgaat ccgccttcga 1440
gctcgggcgg gatctggccc tgaccccggg ccgggtggtg cagcgcaccg agctctatga 1500
gctcattcag tacagcccga ctaccgagac ggtgggcaag acacctgtgc tgatagtgcc 1560
gccttcatc aacaagtact acatcatgga catgcggccc cagaactccc tggtcgcctg 1620
gctggtcgcc cagggccaga cggtattcat gatctcctgg cgcaaccccg gcgtggcccc 1680
ggccccaaatc gatctcgacg actacgtggt ggatggcgtc atgccccgcc tggacggcgt 1740
ggaggcggcc accggcgagc gggaggtgca cggcatcggc tactgcatcg gcggcaccgc 1800
cctgtcgctc gccatgggct ggctggcggc gcggcgccag aagcagcggg tgcgcaccgc 1860
cacccctgttc actaccctgc tggacttctc ccagccccggg gagcttggca tcttcatcca 1920
cgagcccatc atagcggcgc tcgaggcgca aaatgaggcc aagggcatca tggacgggcg 1980
ccagctggcg gtctccttca gcctgctgcg ggagaacagc ctctactgga actactacat 2040
cgacagctac ctcaagggtc agagccccggt ggccttcgat ctgctgcact ggaacagcga 2100
cagcaccaat gtggcgggca agacccacaa cagcctgctg cgccgtctct acctggagaa 2160
ccagctggtg aaggggagc tcaagatccg caacacccgc atcgatctcg gcaaggtgaa 2220
gaccccctgtg ctgctggtgt cggcggtgga cgatcacatc gccctctggc agggcacctg 2280
gcagggcatg aagctgtttg gcggggagca gcgcttcctc ctggcggagt ccggccacat 2340
cgccggcatc atcaacccgc cggccgccaa caagtacggc ttctggcaca acggggccga 2400
ggccgagagc ccggagagct ggctggcagg ggcgacgcac cagggcggct cctggtggcc 2460
cgagatgatg ggctttatcc agaaccgtga cgaagggtca gagcccgtcc ccgcgcgggt 2520
cccggaggaa gggctggccc ccgccccccgg ccactatgtc aaggtgcggc tcaaccccgt 2580
gtttgcctgc ccaacagagg aggacgccgc atgagcgcac aatccctgga agtaggccag 2640
aaggcccgtc tcagcaagcg gttcgggggcg gcggaggtag ccgccttcgc cgcgctctcg 2700
gaggacttca accccctgca cctggacccg gccttcgccg ccaccacggc gttcgagcgg 2760
cccatagtcc acggcatgct gctgccagc ctctttctccg ggctgctggg ccagcagttg 2820
ccgggcaagg ggagcatcta tctgggtcaa agcctcagct tcaagctgcc ggtctttgtc 2880
ggggacgagg tgacggccga ggtggaggtg accgccttc gcgaggacaa gcccatcgcc 2940
accctgacca ccgcatctt cacccaaggc ggcgccttcg ccgtgacggg ggaagccgtg 3000
gtcaagctgc cttaagcacc ggcggcacgc aggcacaatc agcccggccc ctgccgggct 3060
gattgttctc ccccgctccg cttgcccct ttttcggggc aatttggccc aggccctttc 3120
cctgcccccgc ctaactgcct aaaatggccg ccctgccgtg taggcattca tccagctaga 3180
ggaattc 3187

<210> 22
<211> 2535
<212> DNA
<213> Rattus norvegicus

<400> 22
gagcagtacc ccggccactg ccagtgtgtg cgtggtgcag gatagactca tggcttcgcc 60
tctgaggttc gacgggcgtg tggtcctggt caccggcgcc ggggggaggt tgggcagagc 120
ttatgccctg gcttttgcag aaagaggagc attagttgtt gtgaatgact taggagggga 180
cttcaaaggc gttgggaaag gctcttctgc cgcagacaag gtcgtggaag aaataagaag 240
gagaggcggg aaagcggtgg ccaattacga ttcaggcgaa gcaggcgaga agcttgtgaa 300

gacagcactg gacacattcg gcagaataga tgttgtggtg aacaatgctg ggatcctgag 360
ggaccgttcc ttctctagga taagtgatga agactgggat ataattcaaa gagttcattt 420
gcggggctcc ttccaagtga cccgggcagc atgggatcat atgaagaagc agaattatgg 480
aagaatcatt atgacggcct cagcttctgg aatatacagc aactttggcc aggcaaatta 540
tagtgctgca aagctgggcc ttctgggtct cgccaatact ctcgtgattg aaggcaggaa 600
gaacaacatt cattgtaaca ccattgcccc aaacgctggg tcacggatga cagagacggt 660
gatgccagaa gacctcgttg aagccctgaa gccagagtat gtggcaccgc tggtcctttg 720
gctttgccat gagagctgtg aggaaaatgg tggcttgttt gaggttggag caggatggat 780
tggaaaattg cgctgggaga ggaccctggg agccattgtc aggaagcgga atcagcccat 840
gactcccgag gcagtgaggg acaactgggt gaagatctgt gacttcagca atgccagcaa 900
gccgaagagc attcaagagt ccaccggtgg tataatcgaa gttttacata aaatagattc 960
agaaggaatc tcacaaaatc acaccggtca agtggcatct gcagatgcat caggatttgc 1020
tggcgtcgtt ggccacaaac ttccttcatt ttctttcttca tatacggaac tgcagtgcat 1080
tatgtatgcc ctcggagtag gagcttcagt caaaaatcca aaggacttga agtttgttta 1140
tgaagggagt gctgacttct cctgtttgcc tacatttgga gtcattgtcg ctcagaagtc 1200
cttgacgagt ggaggcttag cagaggttcc tgggctgtca atcaactttg caaaggttct 1260
tcatgggggag cagtacttgg agttgtataa gccacttccc cgatcagggg aattaaaatg 1320
tgaagcagtt attgctgaca tcctggataa aggctctggc atagtgattg ttatggacgt 1380
ctattcttat tctggcaagg aacttatatg ctataatcag ttctctgtct tcgttgttgg 1440
ctctggaggc tttggtggaa aacggacatc agaaaaactc aaagcagctg tagccgtacc 1500
ggatcggcct ccagatgctg tactgagaga taccacttca ctgaatcagg ccgctctgta 1560
ccgcctcagt ggagactcga atcctttaca cattgacccg agctttgcga gcattgccgg 1620
ttttgagaaa cccatattac acggattatg tacttttggg ttttctgcaa ggcatgtttt 1680
acagcagttt gcggataatg atgtgtcaag attcaaggcc attaaggttc gttttgccaa 1740
accagtgtat ccaggacaaa ctctacaaac tgagatgtgg aaggaaggaa acagaattca 1800
ttttcaaacc aaggtccaag agactggaga cattgtcatt tccaatgcat atgtggatct 1860
tgttcctaca tctggagttt ccgctcagac accttctgag ggtggagcac tgcagagtgc 1920
tcttgtattt ggggaaatag gtcgacgcct caaggatgtt ggacgtgagg tggtaaagaa 1980
agtaaatgct gtatttgaat ggcatatcac gaaaaatggg aatgttgcag ccaagtggac 2040
catrgacctg aagaacggct ctggagaggt ttaccaaggc cctgccaaag gctctgctga 2100
cacgaccatc acaatttctg atgaggattt catggaagtg gtcctgggca agcttaaccc 2160
acagaatgcc ttcttcagtg gcagactgaa ggcccgagga aacatcatgc tgagccagaa 2220
gctacagatg attctgaaag actatgccaa gctctgaagg acccactgcg tgctttaata 2280
aaaccagaat cattacgttc tgtctacgca gtcatgctcc agccttcttt gaaacgatcc 2340
acggtaatgt gcagcagaaa tcgcttaaca ttttcagatt cagataactt tcagattttc 2400
attttctact aatttttcac atattatttt tataaggaac tgtaatctag ctagcaaata 2460
attgttctgt tcatagatct gtatcttaat aaaaaaaaag tcaaccgaaa aaaaaaaaaa 2520
aaaaaaaaaa aaaaa 2535

<210> 23
<211> 2328
<212> DNA
<213> Ralstonia eutropha

<400> 23
ctgcaggttc cctcccgttt ccattgaaag gactacacaa tgactgacgt tgtcatcgta 60
tccgccgccc gcaccgcggt cggcaagttt ggcggctcgc tggccaagat cccggcaccg 120
gaactgggtg ccgtggtcat caaggcccgg ctggagcgcg ccggcgtcaa gccggagcag 180
gtgagcgaag tcatcatggg ccaggtgctg accgccggtt cgggccagaa ccccgcacgc 240
caggccgcga tcaaggccgg cctgccgggg atggtgccgg ccatgaccat caacaaggtg 300
tgcggctcgg gcctgaaggc cgtgatgctg gccgccaacg cgatcatggc gggcgacgcc 360
gagatcgtgg tggccggcgg ccaggaaaac atgagcgccg ccccgcacgt gctgccgggc 420
tcgcgcgatg gtttccgcat gggcgatgcc aagctggtcg acaccatgat cgtcgacggc 480
ctgtgggacg tgtacaacca gtaccacatg ggcatcaccg ccgagaacgt ggccaaggaa 540
tacggcatca cacgcgaggc gcaggatgag ttcgccgtcg gctcgcagaa caaggccgaa 600
gccgcgcaga aggccggcaa gtttgacgaa gagatcgtcc cggtgctgat cccgcagcgc 660
aagggcgacc cggtggcctt caagaccgac gagttcgtgc gccagggcgc cacgctggac 720
agcatgtccg gcctcaagcc cgccttcgac aaggccggca cggtgaccgc ggccaacgcc 780
tcgggcctga acgacggcgc cgccgcggtg gtggtgatgt cggcggccaa ggccaaggaa 840

```
ctgggcctga ccccgctggc cacgatcaag agctatgcca acgccggtgt cgatcccaag 900
gtgatgggca tgggcccggt gccggcctcc aagcgcgccc tgtcgcgcgc cgagtggacc 960
ccgcaagacc tggacctgat ggagatcaac gaggcctttg ccgcgcaggc gctggcggtg 1020
caccagcaga tgggctggga cacctccaag gtcaatgtga acggcggcgc catcgccatc 1080
ggccacccga tcggcgcgtc gggctgccgt atcctggtga cgctgctgca cgagatgaag 1140
cgccgtgacg cgaagaaggg cctggcctcg ctgtgcatcg gcggcggcat gggcgtggcg 1200
ctggcagtcg agcgcaaata aggaaggggt tttccggggc cgcgcgcggt tggcgcggac 1260
ccggcgacga taacgaagcc aatcaaggag tggacatgac tcagcgcatt gcgtatgtga 1320
ccggcggcat gggtggtatc ggaaccgcca tttgccaqcg gctggccaag qatggctttc 1380
gtgtggtggc cggttgcggc cccaactcgc cgcgccgcga aaagtggctg gagcagcaga 1440
aggccctggg cttcgatttc attgcctcgg aaggcaatgt ggctgactgg gactcgacca 1500
agaccgcatt cgacaaggtc aagtccgagg tcggcgaggt tgatgtgctg atcaacaacg 1560
ccggtatcac ccgcgacgtg gtgttccgca agatgaccca cgccgactgg gatgcggtga 1620
tcgacaccaa cctgacctcg ctgttcaacg tcaccaagca ggtgatcgac ggcatggccg 1680
accgtggctg gggccgcatc gtcaacatct cgtcggtgaa cgggcagaag ggccagttcg 1740
gccagaccaa ctactccacc gccaaggccg gcctgcatgg cttcaccatg gcactggcgc 1800
aggaagtggc gaccaagggc gtgaccgtca acacggtctc tccgggctat atcgccaccg 1860
acatggtcaa ggcgatccgc caggacgtgc tcgacaagat cgtcgcgacg atccccggtc a 1920
agcgcctggg cctgccggaa gagatcgcct cgatctgcgc ctggttgtcg tcggaggagt 1980
ccggtttctc gaccggcgcc gacttctcgc tcaacggcgg ccgcatatg ggctgacctg 2040
ccggcctggt tcaaccagtc ggcagccggc gctggcgccc gcgtattgcg gtgcagccag 2100
cgcggcgcac aaggcggcgg gcgtttcgtt tcgccgcccg tttcgcgggc cgtcaaggcc 2160
cgcgaatcgt ttctgcccgc gcggcattcc tcgatttttg cgccaatttca ccgggttttc 2220
cttaagcccc gtcgcttttc ttagtgcctt gttgggcata gaatcagggc agcggcgcag 2280
ccagcaccat gttcgtgcag cgcggccctc gcgggggcga ggctgcag 2328
```

<210> 24
<211> 1462
<212> DNA
<213> Raphanus sativus

<400> 24

```
gactagtcgc gcgctctctg aactgaagta caagatttcc cgatggccca ttcagcagat 60
tcctccgaca atcccagaga tgttigcatc gtgggtgttg cacgcactcc tatgggtggc 120
tttctcggat ctctctcctc cttaccccgcc acaaagcttg gatcccttgc catcacagct 180
gctctgaaga gagaaatgct gaccogtctc tggtccaagg aagttgtgtt tgggaatgtt 240
ctcagtgcta atttgggtca agctccogct cgtcaggccg ctttaggtgc tgggatctct 300
aactctgtta tctgtaccac tgtcaacaag gtctgtgcct caggcatgaa agctgtgatg 360
attgctgctc agagtatcca gctggggatc aatgatgtag tcgtggcggg tggtatggaa 420
agcatgtcta atacaccaaa gtatcttgca gaagcaagaa aaggatctag gtttggtcat 480
gattctctcg tagatgggat gcttaaggat ggactgtggg atgtctataa cgactgtggg 540
atgggaaagct gtgcagagtt atgcgctgag aagtttgaga taaccaggga gcagcaagat 600
gattacgctg ttcagagctt tgagcgtggt attgctgctc aggaatctgg cgccttcaca 660
tgggagatcg tcccggttga agtttctgga ggaaggggta ggccatcaac cattgttgac 720
aaggatgaag gtcttgggaa gtttgatgct gcaaaaactga ggaaactccg tccgagtttc 780
aaggagaatg gaggcacagt tacagctgga aatgcctcta gcataagtga tggtgcagct 840
gctattgtcc tagtgagtgg agaggaggcg cttcagctag gacttcaagt acttgcaaaa 900
gttaaaggtt atggtgatgc agctcaggag ccagagtttt tcactactgc tcctgctctg 960
gcaataccaa aagctattgc acccaattcg ccctatagtg agtcgtatca agttgattac 1020
tatgagatca atgaagcatt tgcagttgta gcacttgcaa atcaaaagct acttgggatt 1080
agtccggaga aggtgaatgt aaatggagga gccgtctcct taggacatcc tctaggctgc 1140
agtggagccc gtattctaat cacattgctt gggatactga agaagagaaa cggcaagtac 1200
ggtgtgggag gagtgtgcaa cggaggagga ggtgcttctg ctcttgttct tgaagtcgtg 1260
tgatgcattt atatgaatcc caggttgttg aactatatag agcgtatcta ctatcacttct 1320
accaacttgc acttcaagtt tgatattggt tggtctctct caataaatga gtgatgatga 1380
tctttgatgt tgttaagttt atttagttat attatatgaa aactatgttt ctgttaaaaa 1440
aaaaaaaaaa aaaaaaaaaa ac 1462
```

<210> 25
<211> 1440
<212> DNA
<213> Pichia membranifaciens

<400> 25
atggcactcg tcctgcgcag gttcttctcc ggctccgtgg ccagggccac ggcgccagcc 60
agcctgatca agctccaccc ggtctcgcag ctcaaaacaga gacagctgcc cacctacgtg 120
ggccagtcga actcgatcgt gaagtcgctg gtgtggacca cgccgcccag caacgtgctc 180
attgtgaaga agccgtggca ctccaaggtg ctcgacgccg ccatcaacctt catcaagcat 240
ctccacgcaa actacccgtc cgtgaacatc atcgtggtgc ccgaggtcgc cgaggagctc 300
aactcgatcg aacgcaagag ctccgaccca gacacgcccca tcggcatcta cacaggcccg 360
ctcaacgaga tcatctccaa gacagacctc attgtctccc tcggcggaga cggcaccatc 420
ctccgggggcg tgtcgctctt ctccaacacg acggtcccac ccgtcttgtc cttctccctc 480
ggcacactag ggttccttct cccgttcgac ttcaacaact acgcggaggc gttcaaacag 540
atgttcgagt cccgctccag catcctcaaa agagaacgca tagagtgcca catcgtcaag 600
gctagcccgc aatcggaggc gctcaaccag cagcggaagg acctcgaaac gtcctaccag 660
aacacacgct ccctaaacgc acaagaagag gtggaaaggt tgaagcgctt gtccgcagcc 720
atggatgctc cgttcgacaa tctgacagtc tcctccgagc tcgaggccct caagaaattg 780
aaaatccacg ccatgaacga cattgtcctc cacagaggct ctctcccggg attggtcaac 840
ctcgacgtct acatcaacgg caacctactc acacggacaa ccgcagacgg cctcatcttt 900
gccaccccaa caggctccac agcgtactct ctttcggcag gcggttccat cgtccaccca 960
gtcgtcaagt gcatccttct caccccgatc tgtccgcgaa gcttgtcctt caggccattg 1020
atcctcccac taaactccca tatcttgatc aaggtcatcg gcaaggaaaa cgtgaagatc 1080
gactacacca agtgcaacgc caaattgagc atagacggaa ttccgcaact gaaaatggtc 1140
cccggcgacg agatccacat catctccgag tccgtctcca gacttaactc cgtaaacgac 1200
gacgaagacg acatcgcctc cggaacaact gcagacgcac cggactgcgt caatgcttcc 1260
actactgtct cgaaggaatc taagacgaag tatctgggaa gacgccgtgg cgtccaaaag 1320
agaaccgccg aacgaagtgg cgtctggtgt gttgtccaga gtaagggcga ctgggtcaac 1380
ggcatcaacg gaatgttggg attcaacctа ggattcaagt cttccaagtc caacaaatga 1440

<210> 26
<211> 3967
<212> DNA
<213> Saccharomyces cerevisiae

<400> 26
gatcaattct gttaagctct ttacgcatgc ttttatttte ttcactttgg cacattcgct 60
aaagagaaag cgtttgatag ccgctttgc gatttggtcc tatggtatct ttacactatt 120
catcaatcaa aaaatgaaaa atctcccctt taataatatt gctatcatcc taagtcccat 180
ggatcaatgg tataagggta tcgttcctcg atgggatttt tttttcaatt ttacattatt 240
gcgtttgtta agttactcca tggatttttt ggaaagatgg catgaacaat tgagccgcca 300
accttcgata gattacgatg atagacgacc tgaattcaga aaaagtttat ctggttctac 360
tctacaaacc atttatgagt caggtaagaa tgttctggag gaaaaggaac gactggtagc 420
agaacatcac atccaggatt acaactttat caattttatc gcttatatta cttacgcgcc 480
attgtttttа gtgggcccaa ttatcacttt taatgactac ctttatcaat cagaaaataa 540
gcttccttcg ctaacgaaaa aaaacatagg cttctatgcc ctcaaagtat tttcgagttt 600
gcttttgatg gaaattatcc tacattatat ctatgtgggt gcaatagcaa ggaccaaggc 660
atggaacaat gatacaccct tgcaacaggc tatgatcgcg ctgttcaact tgaacattat 720
gtatttaaaa cttttgatcc catggaggct ctttcggctg tgggccatgg tcgatggtat 780
tgatgcacct gaaaatatgc tacgatgtgt ggataataat tatagtacag tgggattctg 840
gagagcctgg catacaagtt ttaacaagtg ggtaatccgt tacatctatg ttccatttgg 900
cgggtccaat aacaaaatat taacgagctt tgccgtattc tcatttgtag caatatggca 960
tgacatccaa ttacgagtgt tgttttgggg gtggttaaca gtcctttttat tattaggcga 1020
aacctacatt actaactgtt ttagtagata tagattcaga agctggtaca ggtttgtttg 1080
cggtatcggt gctgcaataa atatttgcat gatgatgatt attaatgtct atggattttg 1140
cttgggtgca gagggaacga agcttctatt gaagggcata tttaacaatt cacatagtcc 1200
ggagtttttg actgcggtaa tggtaagcct atttattgct gttcaggtaa tgtttgagat 1260
tagagaagaa gaaaaaagac atggcatcaa cttgaaatgt tgatctagtt attagataag 1320

ctatgaaagt caatcctttt aatcgagaat gtaaatatgt ggaatacaca attttaacca 1380
aagtactata tatgcgttac aagtaattta aatttaagtt caccgaagta aaactaactg 1440
caagattgtt acaaagaaca atgcactatt taaatcacac aatggctatt gaaaactgta 1500
actgtcagaa atgctgcatg tatctatatg catcactaag ttgcgacttt taagaaactt 1560
ccacagttct caactcttct ttgtgctttt cacacatttt cacaattttc cgaaatctcc 1620
aaattgaaaa aaaaataaaa ataaaaaaag gcaggagaag actaagtatt cattattcgc 1680
tgttttataa ataaaaggat aaaaaggtta aggatactga ttaaaatgtt tgtcagggtt 1740
aaattgaata aaccagtaaa atggtatagg ttctatagta cgttggattc acattcccta 1800
aagttacaga gcggctcgaa gtttgtaaaa ataaagccag taaataactt gaggagtagt 1860
tcatcagcag atttcgtgtc cccaccaaat tccaaattac aatctttaat ctggcagaac 1920
cctttacaaa atgtttatat aactaaaaaa ccatggactc catccacaag agaagcgatg 1980
gttgaattca taactcattt acatgagtca tacccgagg tgaacgtcat tgttcaaccc 2040
gatgtggcag aagaaatttc ccaggatttc aaatctcctt tggagaatga tcccaaccga 2100
cctcatatac tttatactgg tcctgaacaa gatatcgtaa acagaaacaga cttattggtg 2160
acattgggag gtgatgggac tattttacac ggcgtatcaa tgttcggaaa tacgcaagtt 2220
cctccggttt tagcatttgc tctgggcact ctgggctttc tatcaccgtt tgattttaag 2280
gagcataaaa aggtctttca ggaagtaatc agctctagag ccaaatgttt gcatagaaca 2340
cggctagaat gtcatttgaa aaaaaaggat agcaactcat ctattgtgac ccatgctatg 2400
aatgacatat tcttacatag gggtaattcc cctcatctca ctaacctgga cattttcatt 2460
gatggggaat ttttgacaag aacgacagca gatggtgttg cattggccac tccaacgggt 2520
tccacagcat attcattatc agcaggtgga tctattgttt ccccattagt ccctgctatt 2580
ttaatgacac caatttgtcc tcgctctttg tcattccgac cactgatttt gcctcattca 2640
tcccacatta ggataaagat aggttccaaa ttgaaccaaa aaccagtcaa cagtgtggta 2700
aaacttttctg ttgatggtat tcctcaacag gatttagatg ttggtgatga aatttatgtt 2760
ataaatgagg tcggcactat atacatagat ggtactcagc ttccgacgac aagaaaaact 2820
gaaaatgact ttaataattc aaaaaagcct aaaaggtcag ggatttattg tgtcgccaag 2880
accgagaatg actggattag aggaatcaat gaacttttag gattcaattc tagctttagg 2940
ctgaccaaga gacagactga taatgattaa acgctctgaa tgcaaagatt caatgagatt 3000
ctctaagaat tctattgata agatttaaag gtatttgaca agtagagatc tttatttttt 3060
cttgcatttt gtctagagaa atctcaactg acatactcga catgaaattt ttggtattgt 3120
gtcttttatt ctattgcttt aagaaaactg tgacatatag ggaagacatg cttaacaaga 3180
agatataatt atataatata tatattatta ataataacat ccttactgca gtcctgttgt 3240
gggagaaaat ggagagagac tatgtttcgt atcaattccc aaaatcaaaa aaaaaaaaaa 3300
aaaaaagtta aacaagcact cgctgttcat ttgttttaca agtattcata ctctaatagg 3360
tcattgagct tcttttcttg aggagagatc caatttgaag tcggaataag atttgctttc 3420
attagcgtag gcaataatta tgagataaat ggtgcagcac tattaagtag tgtggatttc 3480
aataatttcc gaattaggaa taaatgcgct aaatagacat cccgttctct ttggtaatct 3540
gcataattct gatgcaatat ccaacaacta tttgtgcaat tatttaacaa aatccaatta 3600
actttcctaa ttagtccttc aatagaacat ctgtattcct ttttttttatg aacaccttcc 3660
taattaggcc atcaacgaca gtaaattttg ccgaatttaa tagcttctac tgaaaaacag 3720
tggaccatgt gaaaagatgc atctcattta tcaaacacat aatattcaag tgagccttac 3780
ttcaattgta ttgaagtgca agaaaaccaa aaagcaacaa caggttttgg ataagtacat 3840
atataagagg gccttttgtt cccatcaaaa atgttactgt tcttacgatt catttacgat 3900
tcaagaatag ttcaaacaag aagattacaa actatcaatt tcatacacaa tataaacgat 3960
taaaaga 3967

<210> 27
<211> 1728
<212> DNA
<213> Saccharomyces cerevisiae

<400> 27
gttattagat aagctatgaa agtcaatcct tttaatcgag aatgtaaata tgtggaatac 60
acaatttaa ccaaagtact atatatgcgt tacaagtaat ttaaatttaa gttcaccgaa 120
gtaaaactaa ctgcaagatt gttacaaaga acaatgcact atttaaatca cacaatggct 180
attgaaaact gtaactgtca gaaatgctgc atgtatctat atgcatcact aagttgcgac 240
ttttaagaaa cttccacagt tctcaactct tctttgtgct tttcacacat tttcacaatt 300
ttccgaaatc tccaaattga aaaaaaaata aaaataaaaa aaggcaggag aagactaagt 360
attcattatt cgctgtttca taaatataaag gataaaaagg ttaaggatac tgattaaaat 420

gtttgtcagg gttaaattga ataaaccagt aaaatggtat aggttctata gtacgttgga 480
ttcacattcc ctaaagttac agagcggctc gaagtttgta aaaatagagg cagtaaataa 540
cttgaggagt agttcatcag cagattttcgt gtccccacca aattccaaat tacaatcttt 600
aatctggcag aacccttttac aaaatgttta tataactaaa aaaccatgga ctccatccac 660
aagagaagcg atggttgaat tcataactca tttacatgag tcatacccca aggtgaacgt 720
cattgttcaa cccgatgtgg cagaagaaat ttcccaggat ttcaaaatctc ctttggagaa 780
tgatcccaac cgacctcata tactttatac tggtcctgaa caagatatcg taaacagaac 840
agacttattg gtgacattgg gaggtgatgg gactatttta cacggcgtat caatgttcgg 900
aaatacgcaa gttcctccgg ttttagcatt tgctctgggc actctgggct ttctattacc 960
gtttgatttt aaggagcata aaaaggtctt tcaggaagta atcagctcta gagccaaatg 1020
tttgcataga acacggctag aatgtcattt gaaaaaaaag gatagcaact catctattgt 1080
gacccatgct atgaatgaca tattcttaca tagggtaat tcccctcatc tcactaacct 1140
ggacattttc attgatgggg aatttttgac aagaacgaca gcagatggtg ttgcattggc 1200
cactccaacg ggttccacag catattcatt atcagcaggt ggatctattg tttccccatt 1260
agtccctgct attttaatga caccaatttg tcctcgctct ttgtcattcc gaccactgat 1320
tttgcctcat tcatcccaca ttaggataaa gataggttcc aaattgaacc aaaaaccagt 1380
caacagtgtg gtaaaacttt ctgatgatgg tattcctcaa caggatttag atgttggtga 1440
tgaaagttat gttataaatg aggtcggcac tatatacata gatggtactc agcttccgac 1500
gacaagaaaa actgaaaatg actttaataa ttcaaaaaag cctaaaaggt cagggattta 1560
ttgtgtcgcc aagaccgaga atgactggat tagaggaatc aatgaacttt gtaggattca 1620
ttctagcttt aggctgacca agagacagac tgataatgat taaacgctct gaatgcaaag 1680
attcaatgag attctctaag aattctattg ataagattta aaggtacc 1728